FRANJO BRÖSSLER

IZRAGJENI ZADATCI
IZ
NENINOVE
ARITMETIKE
ZA
NIŽE RAZREDE.

CIJENA 3 KRUNE.

NAKLADA J. STUDNIČKE & DRUGA SARAJEVO.
AUTOGRAFIRAO M. MILOŠEVIĆ U SARAJEVU.

§17. Djeljivost brojeva.

Vježbe:

1.) Zadani su brojevi mjere broja 36.
36 je mnogokratnik zadanih brojeva.

2.) Mjere od 24 jesu: 2, 3, 4, 6, 8, 12
~"~ –"– 38 –"– 2, 19,
–"– –"– 39 –"– 3, 13,
~"~ ~"~ 57 –"– 3, 19,
~"– –"– 100 –"– 2, 4, 5, 10, 20, 25, 50

3.) Mnogokratnici broja 3 jesu: 6, 9, 12, 15, 18 itd.
~"~ –"– 8 jesu: 16, 24, 32, 40 itd.
–"– –"– 14 –"– 28, 42, 56, 70 –"–
–"– –"– 40 –"– 80, 120, 160, 200 –"–
–"– –"– 100 –"– 200, 300, 400, 500 –"–

Najveći mnogokratnik nijednog broja ne može se zahtijevati, jer su to neiz. mjerno veliki brojevi.

4.) Zadani su brojevi prosti. Nemaju druge mjere osim 1 i sama sebe.

5.) Prosti su brojevi: 13, 23, 83, 93, 89.
Ostali su složeni brojevi.

Zadaci:

1.) Mjere broja 12 jesu: 2, 3, 4, 6.
4 je mjera broja 12, jer je bez ostatka sadržano u 12. Uz ishoda je razloga 12 mnogokratnik broja 4. Najmanja je mjera 2, a najveća 6.

2.) Najmanja mjera od 28 je 2, najveća 14. – 28 je mnogokratnik brojeva: 2, 4, 7, 14.

3.) Prosti su brojevi: 11, 13, 19, 29. Ostali su složeni. Ujere broja 18 jesu: 2, 3, 6, 9.

4.) Prosti su brojevi: 1, 2, 3, 5, 7
11, 13, 17, 19,
23, 29, 31, 37, 41, 43, 47
53, 59, 61, 67, 71, 73, 79, 83, 89, 97

5.) Djeljivi su sa 2 ovi brojevi: 16, 44, 138, 3074, 47386. Drugi nijesu.

6.) Djeljivi su sa 3 ovi brojevi: 318, 423, 17253, 132891, 1783290. Drugi nijesu.

7.) Djeljivi su sa 4 ovi brojevi: 152, 372, 556, 3824, 720032, 1305756. Drugi nijesu.

8.) Djeljivi su sa 9 ovi brojevi: 108, 387, 5436. Drugi nijesu.

9.) Sa 2 su djeljivi: 5748, 1234, 2700, 617310, 34560, 129432.
-"- 3 -"- -"- : 5748, 735, 8019, 2700, 617310, 34560, 129432.
-"- 4 -"- -"- : 5748, 2700, 34560, 129432
-"- 5 -"- -"- : 735, 2700, 617310, 34560,
-"- 8 -"- -"- : 34560, 129432 ; 34560
-"- 9 -"- -"- : 5748, 8019, 2700, 617310
-"- 10 -"- -"- : 2700, 617310, 34560,
-"- 100 -"- -"- : 2700,

10.) Sa 3 su djeljivi: 6, 9, 12, 15, 21, 24 i t.d.
" 4 " " : 8, 12, 16, 20, 24, 28, 32, 36 i t.d.
" 6 " " : 12, 18, 24, 30, 36, 42 i t.d.
" 8 " " : 16, 24, 32, 40, 48, 56, 64 -"-

11.) 1296

12.) 572. Može se pripisati s proizvoljno koliko-god znamenaka.

13.) Nije, jer zadnje 3 znamenke uzete kao broj nijesu djeljive sa 8.

14.) Jedinice i stotice: (73425).

§ 18. Rastavljanje brojeva na faktore.

1.) Može se lahko izvesti iz prethodnjega.

2.) a.) 2110 | 2 ; 120 | 2 ; 60 | 2 ; 30 | 2 ; 15 | 3 ; 5 | 5

b.) 270 | 2 ; 135 | 3 ; 45 | 3 ; 15 | 3 ; 5 | 5

c.) 340 | 2 ; 170 | 2 ; 85 | 5 ; 17 | 17

d.) 420 | 2 ; 210 | 2 ; 105 | 3 ; 35 | 5 ; 7 | 7

e.) 926 | 2 ; 463 | 463

3.) a.) 360 | 2 ; 180 | 2 ; 90 | 2 ; 45 | 3 ; 15 | 3 ; 5 | 5

b.) 366 | 2 ; 183 | 3 ; 61 | 61

c.) 540 | 2 ; 270 | 2 ; 135 | 3 ; 45 | 3 ; 15 | 3 ; 5 | 5

d.) 680 | 2 ; 340 | 2 ; 170 | 2 ; 85 | 5 ; 17 | 17

e.) 936 | 2 ; 468 | 2 ; 234 | 2 ; 117 | 3 ; 39 | 3 ; 13 | 13

4.) a.)
1000	2
500	2
250	2
125	5
25	5
5	5

b.)
1500	2
750	2
375	3
125	5
25	5
5	5

c.)
1536	2
768	2
384	2
192	2
96	2
48	2
24	2
12	2
6	2
3	3

d.)
1440	2
720	2
360	2
180	2
90	2
45	3
15	3
5	5

e.)
2646	2
1323	3
441	3
147	3
49	7
7	7

5.) a.)
3095	5
619	619

b.)
4578	2
2289	3
763	3
254	

c.)
5250	2
2625	3
875	5
175	5
35	5
7	7

d.)
13832	2
6916	2
3458	2
1729	1729

§19. Najveća zajednička mjera.

1.)
8	2
4	2
2	2

12	2
6	2
3	3

N. z. m = 2.2 = 4

b.)
24	2
12	2
6	2
3	3

60	2
30	2
15	3
5	5

N. z. m = 2.2.3 = 12

c.) 6, 15, N. z. mj. = 3

d.) 15, 24, N. z. m. = 3

e.)
48	2
24	2
12	2
6	2
3	3

60	2
30	2
15	3
5	5

N. z. m. = 2.2.3 = 12

f.)
60	2
30	2
15	3
5	5

96	2
48	2
24	2
12	2
6	2
3	3

N. z. m = 2.2.3 = 12

g.)
72	2
36	2
18	2
9	3
3	3

80	2
40	2
20	2
10	2
5	5

N. z. m. = 2.2.2 = 8

2.) a.)
15	3
5	5

21	3
7	7

25	5
5	5

N. z. m = nemaje!

b.)
18	2
9	3
3	3

30	2
15	3
5	5

48	2
24	2
12	2
6	2
3	3

N. z. m. = 2.3 = 6

c.)
40	2
20	2
10	2
5	5

64	2
32	2
16	2
8	2
4	2
2	2

72	2
36	2
18	2
9	3
3	3

N. z. m = 2.2.2 = 8

d.)
300	2
150	2
75	3
25	5
5	5

360	2
180	2
90	2
45	3
15	3
5	5

840	2
420	2
210	2
105	3
35	5
7	7

N. z. m = 2.2.3.5 = 60

c.) 104 | 2 — 52 | 2 — 26 | 2 — 13 | 13
125 | 3 — 175 | 5 — 35 | 5 — 7 | 7
712 | 2 — 356 | 2 — 178 | 2 — 89 | 89
Zajedničke mjere nema

3.) a.) 252, 396 | 1 — 108, 144 | 1 — == 36 | 3
N. z. m = 36

b.) 448, 576 | 1 — 64, 128 | 2
N. z. m = 64

c.) 1710, 4389 | 2 — 741 969 | 1 — 57 228 | 3 — 4
N. z. m. = 57

d.) 15876, 86435 | 5 — 1766 7055 | 2 — 9 1757 | 3 — 1 2 | 95 — 4
Zaj. mjere nema.

e.) 660, 840, 1320
660, 840 | 1 — 120, 180 | 3 — 60 | 2
60, 1320 | 22
N. z. m = 60

f.) 1836, 504, 324,
324, 504 | 1 — 144, 180 | 1 — 36 | 4
36, 1836 | 51
N. z. m = 36

g.) 435, 522, 667,
435, 522 | 1 — 87 | 5
87, 667 | 7 — 29, 58 | 1 — 2
N. z. m = 29

h.) 1554, 3552, 5734
1554, 3552 | 2 — 222, 444 | 3 — 2
222, 5734 | 23 — 26, 28 | 7 — 2 | 1 — 13
N. z. m = 2

i.) 16614, 21726, 23430
16614, 21726 | 1 — 1278, 5712 | 3 — 4
1278, 23430 | 18 — 426 | 3
N. z. m. = 426

4.) a.) 2 i 4, b.) 3 i 5, c.) Nema
d.) 2 i 7, 7 i 11, 77 i 2, 22 i 7, 14 i 11, 2 i 11

5.) a.) 2, 3, 6, b.) 2, 4, 8, c.) Nema
d.) 2, 6, 8; 6, 12, 3
e.) 5, 7, 35, f.) 3, 19, 57

§20. Najmanji zajednički mnogokratnik.

1.) a.) 2, 10; N. z. mn. = 10

b.) 8, 12 | 2 — 4 6 | 2 — 2 3
N. z. mn = 24

c.) 6, 20 | 2 — 3 10
N. z. mn = 60

d.) 6, 8 | 2 — 3 4
N. z. mn. = 24

e.) 18, 30 | 2 — 9, 15 | 3 — 3, 5
N. z. mn = 90

f.) 18, 48 | 2 — 9, 24 | 2 — 9, 12 | 2 — 9, 6 | 2 — 9, 3 | 3 — 3, 1
N. z. mn. = 144

g.)
24, 30	2
12, 15	2
6, 15	2
3, 15	3
1 5	

N. z. mn. = 120

h.)
60, 72	2
30, 36	2
15, 18	2
15, 9	3
5, 3	

N. z. mn. = 360

i.)
76, 90	2
38, 45	2
19, 45	

N. z. mn. = 3420

2.) a.) 3, 5, 6 ; N. z. mn. = 30

b.) 3, 5, 8 ; N. z. mn = 120

c.)
4, 6, 9	2
2, 3, 9	3
2, 1, 3	

N. z. mn. = 36

d.) 2, 5, 7
N. z. mn. = 70

e.) 3, 5, 10
N. z. mn. = 30

f.)
6, 8, 12	2
4 6	2
2 3	

N. z. mn. = 24

g.) Tiskarska pogriješka!

h.)
8, 15, 20	2
4, 15, 10	2
2, 15, 5	3
2, 5, 5	5
2, 1, 1	

N. z. mn. = 120

i.)
54, 72, 126	2
27, 36, 63	2
27, 18, 63	2
27, 9, 63	3
9, 3, 21	3
3, 1, 7	3

N. z. mn. = 1512

3.) a.)
5, 6, 10, 12	2,
5, 6	

N. z. mn. = 60

b.) 2, 3, 5, 40

N. z. mn. = 120

c.) 2, 5, 16, 25 ; N. z. mn. = 400

d.) 2, 3, 5, 10 ; N. z. mn. = 30

e.)
5, 12, 16, 20	2
6, 8, 10	2
3, 4, 5	

N. z. mn. = 240

4.) a.)
2, 3, 4, 5, 6	2
2 5 3	

N. z. mn = 60

4.) b.)
35, 9, 14, 18, 21	2
5, 7, 9, 21	3
5, 7, 3, 7	7
5, 1, 3, 1	

N. z. mn = 630

c.)
2, 3, 5, 8, 12, 18, 28, 40	2
6, 9, 14, 20	2
3, 9, 7, 10	3
1, 3, 7, 10	

N. z. mn. = 2520

d.)
5, 12, 8, 10, 28, 21, 15, 30, 60		2
4 14, 21,	30	2
2 7, 21,	15	3
2 7, 7,	5	7
2 1, 1,	5	

N. z. mn. = 840

5.) a.)
468, 624	2
234, 312	2
117, 156	2
117, 78	2
117, 39	3
39, 13	3
13, 13	13
1, 1,	

N. z. mn. = 1972

b.)
378, 462	2
189, 231	3
63, 77	3
21, 77	3
7, 77	7
1 11	

N. z. mn. = 4158

c.)

264, 396	2
132, 198	2
66, 99	2
33, 99	3
11, 33	11
1, 3	

N. z. mn. = 792

d.)

3080, 3465	2
1540, 3465	2
770, 3465	2
385, 3465	3
385, 1155	3
385 385	385

N. z. mn. = 27720

e.)

84, 126, 441	2
42, 63, 441	2
21, 63, 441	3
7, 21, 147	3
7, 7, 49	7
1, 1, 7	

N. z. mn. = 1764.

Obični razlomci

§§ 21., 22., 23. i 24. izostavljeni su poradi jednostavne izradbe.

§ 25. Preobražavanje razlomaka.

1.) $\frac{5}{2} = 2\frac{1}{2}$; $\frac{23}{2} = 11\frac{1}{2}$; $\frac{20}{3} = 6\frac{2}{3}$; $\frac{15}{4} = 3\frac{3}{4}$; $\frac{42}{4} = 10\frac{2}{4}$; $\frac{46}{6} = 7\frac{4}{6}$; $\frac{34}{7} = 4\frac{6}{7}$; $\frac{53}{10} = 5\frac{3}{10}$; $\frac{123}{16} = 7\frac{11}{16}$; $\frac{715}{32} = 22\frac{11}{32}$; $\frac{81}{61} = 1\frac{20}{61}$; $\frac{573}{82} = 6\frac{81}{82}$; $\frac{2397}{127} = 18\frac{111}{127}$; $\frac{2178}{33} = 66$; $\frac{2779}{405} = 6\frac{349}{405}$; $\frac{1834}{329} = 5\frac{189}{329}$; $\frac{26853}{724} = 37\frac{65}{724}$; $\frac{89714}{1543} = 5\frac{1259}{1543}$;

2.) $394 : 16 = 24\frac{10}{16} = 24\frac{5}{8}$; $2004 : 317 = 6\frac{102}{317}$

$1536 : 144 = 10\frac{96}{144} = 10\frac{2}{3}$; $49268 : 259 = 190\frac{178}{259} =$
$18437 : 421 = 43\frac{334}{421}$; $52642 : 1091 = 48\frac{274}{1091}$;

3.) $1\frac{3}{8} = \frac{11}{8}$; $2\frac{3}{4} = \frac{11}{4}$; $6\frac{7}{8} = \frac{55}{8}$; $3\frac{7}{15} = \frac{52}{15}$; $17\frac{1}{3} = \frac{52}{3}$; $28\frac{1}{5} = \frac{141}{5}$; $102\frac{7}{12} = \frac{1231}{12}$; $24\frac{17}{20} = \frac{497}{20}$; $28\frac{43}{81} = \frac{2311}{81}$; $82\frac{31}{125} = \frac{10281}{125}$; $39\frac{243}{625} = \frac{24618}{625}$;

4.) a.) $\frac{1}{2} = \frac{5}{10}$; $\frac{7}{2} = \frac{35}{10}$; $\frac{2}{5} = \frac{4}{10}$; $\frac{3}{5} = \frac{6}{10}$; $\frac{4}{5} = \frac{8}{10}$; b.) $\frac{3}{4} = \frac{15}{20}$; $\frac{2}{5} = \frac{8}{20}$; $\frac{7}{10} = \frac{14}{20}$; $\frac{9}{5} = \frac{36}{20}$; c.) $\frac{3}{4} = \frac{45}{60}$; $\frac{2}{3} = \frac{40}{60}$; $\frac{5}{6} = \frac{50}{60}$; $\frac{7}{10} = \frac{42}{60}$; $\frac{8}{5} = \frac{96}{60}$; $\frac{13}{6} = \frac{130}{60}$; $\frac{5}{12} = \frac{25}{60}$; $\frac{8}{15} = \frac{32}{60}$; $\frac{7}{20} = \frac{21}{60}$; $\frac{7}{30} = \frac{14}{60}$;

d.) $\frac{3}{4} = \frac{75}{100}$; $\frac{2}{5} = \frac{40}{100}$; $\frac{7}{10} = \frac{70}{100}$; $\frac{9}{20} = \frac{45}{100}$; $\frac{7}{25} = \frac{28}{100}$; e.) $\frac{1}{3} = \frac{48}{144}$; $\frac{3}{4} = \frac{108}{144}$; $\frac{5}{6} = \frac{120}{144}$; $\frac{11}{16} = \frac{264}{144}$; $\frac{4}{9} = \frac{64}{144}$; $\frac{7}{12} = \frac{84}{144}$; $\frac{11}{16} = \frac{99}{144}$; $\frac{5}{36} = \frac{20}{144}$; $\frac{13}{24} = \frac{78}{144}$; $\frac{31}{48} = \frac{93}{144}$;

5.) a.) $\frac{2}{3} = \frac{8}{12}$; $\frac{3}{4} = \frac{9}{12}$; b.) $\frac{4}{5} = \frac{8}{10}$; $\frac{7}{10} = \frac{7}{10}$; c.) $\frac{5}{6} = \frac{25}{30}$; $\frac{7}{15} = \frac{14}{30}$; d.) $\frac{5}{12} = \frac{25}{60}$; $\frac{4}{15} = \frac{16}{60}$; e.) $\frac{3}{8} = \frac{15}{40}$; $\frac{9}{20} = \frac{18}{40}$; f.) $\frac{1}{2} = \frac{6}{12}$; $\frac{2}{3} = \frac{8}{12}$; $\frac{3}{4} = \frac{9}{12}$; g.) $\frac{1}{3} = \frac{10}{30}$; $\frac{5}{6} = \frac{25}{30}$; $\frac{4}{5} = \frac{24}{30}$; h.) $\frac{1}{2} = \frac{20}{40}$; $\frac{3}{8} = \frac{15}{40}$; $\frac{7}{10} = \frac{28}{40}$;

i.) $\frac{2}{3}=\frac{8}{12}$; $\frac{3}{4}=\frac{9}{12}$; $\frac{5}{6}=\frac{10}{12}$; k.) $\frac{1}{2}=\frac{8}{16}$;
$\frac{3}{4}=\frac{12}{16}$; $\frac{3}{8}=\frac{6}{16}$; $\frac{5}{16}=\frac{5}{16}$; l.) $\frac{3}{8}=\frac{210}{560}$;
$\frac{7}{20}=\frac{196}{560}$; $\frac{13}{28}=\frac{260}{560}$; m.) $\frac{2}{5}=\frac{48}{120}$; $\frac{3}{8}=$
$\frac{45}{120}$; $\frac{4}{15}=\frac{32}{120}$; $\frac{11}{20}=\frac{66}{120}$; n.) $\frac{2}{3}=\frac{320}{480}$;
$\frac{4}{5}=\frac{384}{480}$; $\frac{3}{32}=\frac{45}{480}$; $\frac{9}{40}=\frac{108}{480}$;
o.) $\frac{13}{21}=\frac{676}{1092}$; $\frac{35}{39}=\frac{980}{1092}$; $\frac{5}{12}=\frac{455}{1092}$;
$\frac{7}{52}=\frac{147}{1092}$;

6.) a.) $\frac{12}{18}=\frac{2}{3}$; $\frac{15}{20}=\frac{3}{4}$; $\frac{15}{24}=\frac{5}{8}$;
$\frac{10}{25}=\frac{2}{5}$; $\frac{18}{30}=\frac{3}{5}$; $\frac{20}{36}=\frac{5}{9}$; $\frac{25}{40}=\frac{5}{8}$;
$\frac{14}{48}=\frac{7}{24}$; $\frac{22}{50}=\frac{11}{25}$; $\frac{27}{63}=\frac{3}{7}$; $\frac{48}{64}=\frac{3}{4}$;
$\frac{48}{72}=\frac{2}{3}$; $\frac{60}{84}=\frac{5}{7}$; $\frac{36}{96}=\frac{3}{8}$;
b.) $\frac{102}{141}=\frac{34}{47}$; $\frac{27}{108}=\frac{1}{4}$; $\frac{192}{240}=\frac{4}{5}$;
$\frac{240}{335}=\frac{48}{67}$; $\frac{750}{600}=\frac{5}{4}$; $\frac{625}{1000}=\frac{5}{8}$; $\frac{676}{1092}=$
$=\frac{13}{21}$; $\frac{420}{2520}=\frac{1}{6}$; $\frac{2772}{5148}=\frac{7}{13}$

§.26. Zbrajanje razlomaka.

1.) a.) $\frac{1}{10}+\frac{3}{10}=\frac{4}{10}=\frac{2}{5}$;
b.) $\frac{3}{8}+\frac{5}{8}+\frac{1}{8}=\frac{9}{8}$;
c.) $\frac{5}{7}+\frac{1}{7}+\frac{4}{7}+\frac{3}{7}=\frac{13}{7}$

2.) a.) $3\frac{5}{6}+8=11\frac{5}{6}=\frac{71}{6}$

b.) $7\frac{3}{4}+\frac{3}{4}=7\frac{6}{4}=7\frac{3}{2}=8\frac{1}{2}$
c.) $18\frac{7}{20}+15\frac{17}{20}=33\frac{24}{20}=33\frac{6}{5}=34\frac{1}{5}$
d.) $9\frac{11}{24}+2\frac{19}{24}+12\frac{17}{24}=23\frac{47}{24}=24\frac{23}{24}$

3.) a.) $\frac{1}{2}+\frac{2}{3}=\frac{3}{6}+\frac{4}{6}=\frac{3+4}{6}=\frac{7}{6}$
b.) $\frac{1}{2}+\frac{7}{8}=\frac{4}{8}+\frac{7}{8}=\frac{4+7}{8}=\frac{11}{8}$
c.) $\frac{3}{4}+\frac{3}{5}=\frac{15+12}{20}=\frac{27}{20}$
d.) $\frac{5}{8}+\frac{3}{4}=\frac{5+6}{8}=\frac{11}{8}$
e.) $\frac{1}{3}+\frac{1}{4}+\frac{5}{6}=\frac{4+3+10}{12}=\frac{17}{12}$
f.) $\frac{1}{2}+\frac{3}{4}+\frac{7}{8}=\frac{4+6+7}{8}=\frac{7}{8}$
g.) $\frac{3}{4}+\frac{4}{5}+\frac{5}{6}+\frac{7}{8}=\frac{90+96+100+105}{120}=\frac{391}{120}$

4.) a.) $7\frac{2}{5}+\frac{7}{10}=7\frac{4}{10}+\frac{7}{10}=7\frac{11}{10}=8\frac{1}{10}$
b.) $8\frac{5}{6}+2\frac{7}{15}=8\frac{25}{30}+2\frac{14}{30}=10\frac{39}{30}=$
$11\frac{9}{30}=11\frac{3}{10}$;
c.) $6\frac{5}{12}+3\frac{8}{15}=6\frac{25}{60}+9\frac{57}{60}=9\frac{19}{20}$.

5.) a.) $9\frac{3}{10}+18+7\frac{4}{15}=34\frac{3}{10}+\frac{4}{15}=$
$=34\frac{9}{30}+\frac{8}{30}=34\frac{17}{30}$;
b.) $13\frac{1}{2}+18\frac{3}{5}+\frac{7}{15}=31\frac{1}{2}+\frac{3}{5}+\frac{7}{15}=$
$=31\frac{15}{30}+\frac{18}{30}+\frac{14}{30}=31\frac{47}{30}=32\frac{17}{30}$
c.) $2\frac{4}{7}+3\frac{5}{11}+8\frac{6}{13}=13\frac{4}{7}+\frac{5}{11}+\frac{6}{13}=$
$=13\frac{572+455+462}{1001}=13\frac{1489}{1001}=14\frac{488}{1001}$
d.) $3\frac{2}{4}+15\frac{1}{2}+\frac{11}{12}+1\frac{5}{6}+3\frac{2}{3}=$
$=22\frac{3}{4}+\frac{1}{2}+\frac{11}{12}+\frac{2}{3}=22\frac{9+6+11+8}{12}=$
$=22\frac{34}{12}=24\frac{10}{12}=24\frac{5}{6}$

6.) $28\frac{3}{4} + 6\frac{5}{6} = 34\frac{3}{4} + \frac{5}{6} = 34\frac{9}{12} + \frac{10}{12} =$
$= 34\frac{19}{12} = 35\frac{7}{12}$

7.) $17\frac{3}{8} + 25\frac{5}{15} + 35\frac{4}{7} = 77\frac{3}{8} + \frac{1}{3} + \frac{4}{7} =$
$= 77\frac{63}{168} + \frac{56}{168} + \frac{96}{168} = 77\frac{215}{168} = 78\frac{47}{168}$

8.) $3\frac{1}{4} + 6\frac{1}{5} + 5\frac{3}{8} = 14\frac{1}{4} + \frac{1}{5} + \frac{3}{8} = 14\frac{10}{40} +$
$+ \frac{8}{40} + \frac{15}{40} = 14\frac{33}{40}\ m$

9.) $58\frac{3}{8} + 37\frac{1}{4} + 45\frac{1}{2} + 84\frac{5}{8} = 224\frac{8}{8} +$
$+ \frac{1}{4} + \frac{1}{2} = 225\frac{3}{4}\ kl$

10.) $7\frac{3}{10} + 12\frac{3}{4} + 8\frac{4}{5} + 15\frac{9}{20} + 19\frac{1}{2} =$
$= 61\frac{3}{10} + \frac{3}{4} + \frac{4}{5} + \frac{9}{20} + \frac{1}{2} = 61\frac{6}{20} + \frac{15}{20} +$
$+ \frac{16}{20} + \frac{9}{20} + \frac{10}{20} = 61\frac{56}{20} = 63\frac{16}{20} =$
$= 63\frac{4}{5}$

11.) $83\frac{3}{4} + 9\frac{2}{5} = 92\frac{3}{4} + \frac{2}{5} = 92\frac{15}{20} + \frac{8}{20} =$
$= 92\frac{23}{20} = 93\frac{3}{20}$ i

12.) $\frac{1}{4} + \frac{1}{5} = \frac{5}{20} + \frac{4}{20} = \frac{9}{20}$ knjige

13.) Jedan radnik svrši na dan $\frac{1}{6}$ cijeloga posla, a drugi $\frac{7}{10}$. Skupa dakle svrše $\frac{1}{6} + \frac{1}{10} = \frac{5}{30} + \frac{3}{30} = \frac{8}{30} =$
$\frac{4}{15}$ posla.

14.) Kroz prvu cijev napuni se dakle za 1h $\frac{1}{4}$ posude; kroz drugu $\frac{1}{6}$, a kroz treću $\frac{1}{5}$. Za 1 sat se dakle napuni $\frac{1}{4} + \frac{1}{6} + \frac{1}{5} = \frac{15}{60} + \frac{10}{60} + \frac{12}{60} =$
$= \frac{37}{60}$ posude.

§ 27. Oduzimanje razlomaka.

1.) a.) $\frac{5}{8} - \frac{3}{8} = \frac{2}{8} = \frac{1}{4}$
b.) $\frac{9}{16} - \frac{7}{16} = \frac{2}{16} = \frac{1}{8}$
c.) $\frac{17}{20} - \frac{9}{20} = \frac{8}{20} = \frac{2}{5}$

2.) a.) $4\frac{13}{36} - \frac{7}{36} = 4\frac{6}{36} = 4\frac{1}{6}$
b.) $8\frac{3}{10} - \frac{7}{10} = 7\frac{13}{10} - \frac{7}{10} = 7\frac{6}{10} = 7\frac{3}{5}$
c.) $12 - \frac{3}{5} = 11\frac{5}{5} - \frac{3}{5} = 11\frac{2}{5}$
d.) $7\frac{5}{8} - 3\frac{7}{8} = 6\frac{13}{8} - 3\frac{7}{8} = 3\frac{6}{8} = 3\frac{3}{4}$

3.) a.) $\frac{2}{5} - \frac{14}{15} = \frac{6}{15} - \frac{14}{15} = \frac{2}{15}$
b.) $\frac{7}{8} - \frac{1}{4} = \frac{7}{8} - \frac{2}{8} = \frac{5}{8}$
c.) $\frac{3}{4} - \frac{7}{10} = \frac{15}{20} - \frac{14}{20} = \frac{1}{20}$
d.) $\frac{11}{16} - \frac{5}{12} = \frac{33}{48} - \frac{20}{48} = \frac{13}{48}$

4.) a.) $6\frac{7}{8} - 3\frac{2}{3} = 3\frac{7}{8} - \frac{2}{3} = 3\frac{21}{24} - \frac{16}{24} =$
$= 3\frac{5}{24}$
b.) $12\frac{3}{5} - 8\frac{7}{10} = 4\frac{3}{5} - \frac{7}{10} = 4\frac{6}{10} - \frac{7}{10} =$
$= 3\frac{16}{10} - \frac{7}{10} = 3\frac{9}{10}$ i
c.) $10\frac{3}{8} - 5\frac{7}{12} = 5\frac{3}{8} - \frac{7}{12} = 5\frac{9}{24} - \frac{14}{24} =$
$= 4\frac{33}{24} - \frac{14}{24} = 4\frac{19}{24}$ i

5.) a.) $8\frac{7}{25} - 3 = 5\frac{7}{25}$ i
b.) $24\frac{7}{10} - 21 = 3\frac{7}{10}$ i
c.) $53 - 27\frac{23}{60} = 26 - \frac{23}{60} = 25\frac{60}{60} -$
$- \frac{23}{60} = 25\frac{37}{60}$

6.) a.) $188\frac{4}{9} - 56\frac{3}{10} = 132\frac{40}{90} - \frac{27}{90} = 132\frac{13}{90}$

b.) $237\frac{119}{120} - 125\frac{43}{56} = 112\frac{833}{840} - \frac{645}{840} =$

$= 112\frac{188}{840} = 112\frac{47}{210}$;

7.) $17\frac{1}{8} - 4\frac{2}{3} = 13\frac{3}{24} - \frac{16}{24} = 12\frac{27}{24} - \frac{16}{24} =$

$= 12\frac{11}{24}$;

8.) a.) $\frac{6}{12} - \frac{5}{11} = \frac{66}{132} - \frac{60}{132} = \frac{6}{132} = \frac{1}{22}$

b.) $\frac{7}{13} - \frac{5}{11} = \frac{77}{143} - \frac{65}{143} = \frac{12}{143}$

c.) $\frac{8}{14} - \frac{5}{11} = \frac{88}{154} - \frac{70}{154} = \frac{18}{154} = \frac{9}{77}$

9.) a.) $\frac{7}{8} - \frac{6}{7} = \frac{49}{56} - \frac{48}{56} = \frac{1}{56}$

b.) $\frac{7}{8} - \frac{5}{6} = \frac{42}{48} - \frac{40}{48} = \frac{2}{48} = \frac{1}{24}$

c.) $\frac{7}{8} - \frac{4}{5} = \frac{35}{40} - \frac{32}{40} = \frac{3}{40}$

10.) $3\frac{1}{2} + 8\frac{2}{3} + 19\frac{5}{12} = 30\frac{6}{12} + \frac{8}{12} + \frac{5}{12} =$

$= 30\frac{19}{12} = 31\frac{7}{12}$;

$31\frac{57}{84} - 31\frac{7}{12} = \frac{57}{84} - \frac{49}{84} = \frac{5}{84}$

11.) $17\frac{1}{10} - 2\frac{9}{8} = 15\frac{4}{10} - \frac{45}{40} = 14\frac{44}{40} - \frac{45}{40} = 14\frac{29}{40}$

12.) $234\frac{3}{8} - 194\frac{2}{5} = 40\frac{15}{40} - \frac{16}{40} = 39\frac{55}{40} - \frac{16}{40} = 39\frac{39}{40}$

13.) a.) $36\frac{3}{10} - 28\frac{3}{4} = 8\frac{6}{20} - \frac{15}{20} = 7\frac{26}{20} - \frac{15}{20} = 7\frac{11}{20}$ kl

b.) $28\frac{3}{4} - 23\frac{7}{10} = 5\frac{15}{20} - \frac{14}{20} = 5\frac{1}{20}$ kl

14.) $87\frac{3}{10} - 12\frac{1}{4} = 75\frac{6}{20} - \frac{5}{20} = 75\frac{1}{20}$ kl

15.) $2484 + 391\frac{2}{5} + 420\frac{3}{4} = 3298\frac{2}{5} + \frac{3}{4} =$

$3298\frac{8}{20} + \frac{15}{20} = 3299\frac{3}{20}$ kg = težina bačava sa robom;

$18\frac{1}{5} + 17\frac{7}{8} + 19\frac{1}{2} = 54\frac{1}{5} + \frac{7}{8} + \frac{1}{2} =$

$= 54\frac{8}{40} + \frac{35}{40} + \frac{20}{40} = 54\frac{63}{40} = 55\frac{23}{40}$ kg =

= težina samih bačava.

$3299\frac{3}{20} - 55\frac{23}{40} = 3241\frac{6}{40} - \frac{23}{40} =$

$= 3243\frac{46}{40} - \frac{23}{40} = 3243\frac{23}{40}$ kg = težina robe.

16.) $80\frac{1}{2} + 137\frac{3}{5} + 103\frac{3}{4} = 320\frac{1}{2} + \frac{3}{5} + \frac{3}{4} =$

$= 320\frac{10}{20} + \frac{12}{20} + \frac{15}{20} = 320\frac{37}{20} = 321\frac{17}{20}$ K.

To je sova, koju je Jovana odpeglao!

$340\frac{2}{5} - 321\frac{17}{20} = 19\frac{8}{20} - \frac{17}{20} = 18\frac{28}{20} - \frac{17}{20} =$

$= 18\frac{11}{20}$ K je sova, koju još duguje.

17.) Daljina nije uvijek isla, nego je uvijek za razliku prvih dvaju poteza veća od daljine predidućih dvaju poteza. (Kojeri se o tom konstrukcijom.)

$\frac{1}{7} - \frac{1}{8} = \frac{8}{56} - \frac{7}{56} = \frac{1}{56}$ m = udaljenost prvih dvaju poteza. Udaljenost drugih dvaju poteza = $\frac{2}{56}$, trećih $\frac{3}{56}$ i t.d.

18.) Za 1 sat doteče kroz prvu cijev $\frac{1}{10}$ rezervoara. Da voda kroz drugu cijev ne odiče, bilo bi iza jednog sata u svemu $\frac{7}{9} + \frac{1}{10} = \frac{70}{90} + \frac{9}{90} = \frac{79}{90}$ rezervoara vode. Budući da kroz drugu cijev dotče za 1 sat $\frac{1}{6}$ rezervoara, to će iza jednog sata u istini biti $\frac{79}{90} - \frac{1}{6} =$

$= \frac{79}{90} - \frac{15}{90} = \frac{64}{90} = \frac{32}{45}$ rezervoara vode. dijelova

19.) $\frac{4}{5} - \frac{2}{3} = \frac{12}{15} - \frac{10}{15} = \frac{2}{15}$ m je razlika pojedinih r.

20.) $33\frac{7}{10} - 21\frac{83}{100} = 12\frac{70}{100} - \frac{83}{100} = 11\frac{170}{100} - \frac{83}{100} = 11\frac{87}{100}$ kg.

§ 28. Množenje razlomaka s cijelim brojem.

1.) a.) $\frac{3}{7} \times 8 = \frac{24}{7}$; b.) $\frac{5}{14} \times 2 = \frac{10}{14}$;
c.) $\frac{x}{8} \times 12 = \frac{84}{8}$; d.) $\frac{7}{30} \times 15 = \frac{105}{30} = \frac{7}{2}$

2.) a.) $3\frac{5}{6} \times 8 = 24\frac{40}{6} = 30\frac{4}{6} = 30\frac{2}{3}$
b.) $17\frac{4}{5} \times 10 = 170\frac{40}{5} = 178$;
c.) $24\frac{5}{16} \times 8 = 192\frac{40}{16} = 194\frac{8}{16} = 194\frac{1}{2}$

3.) a.) $73\frac{5}{8} \times 24 = 1752\frac{120}{8} = 1767$
b.) $124\frac{4}{9} \times 42 = 5208\frac{168}{9} = 5226\frac{6}{9} = 5226\frac{2}{3}$
c.) $183\frac{11}{12} \times 63 = 11529\frac{441}{12} = 11565\frac{9}{12} = 11565\frac{3}{4}$;

4.) $7\frac{11}{16} \times 36 = 252\frac{396}{16} = 276\frac{12}{16} = 276\frac{2}{4}$;

5.) a.) $3\frac{4}{5} \times 6 = 18\frac{24}{5} = 22\frac{4}{5}$ K u nedjelji doma. b.) $3\frac{4}{5} \times 31 = 93\frac{124}{5} = 117\frac{4}{5}$ K u srpnju. c.) $3\frac{4}{5} \times 30 = 90\frac{120}{5} = 114$ K u lipnju.

6.) a.) $4\frac{x}{20} \times 6 = 24\frac{42}{20} = 26\frac{2}{20} = 26\frac{1}{10}$ K
b.) $4\frac{x}{20} \times 15 = 60\frac{105}{20} = 65\frac{5}{20} = 65\frac{1}{4}$ K.

7.) Jedan radnik treba 6 puta toliko vremena. $12\frac{1}{2} \times 6 = 72\frac{6}{2} = 75$ dana.

8.) a.) $2\frac{x}{15} \times 9 = 18\frac{63}{15} = 22\frac{3}{15} = 22\frac{1}{5}$ kg (zlatna kugla); b.) $1\frac{1}{3} \times 9 = 9\frac{9}{3} = 12$ kg (srebrena kugla).

9.) a.) $8\frac{1}{4} \times 2 = 16\frac{2}{4} = 16\frac{1}{2}$ K.
b.) $8\frac{1}{4} \times 5 = 40\frac{5}{4} = 41\frac{1}{4}$ K.

9.) c.) $8\frac{1}{4} \times 13 = 104\frac{13}{4} = 107\frac{1}{4}$ K
d.) $8\frac{1}{4} \times 268 = 2144\frac{268}{4} = 2211$ K

10.) a.) $\frac{2}{25} \times 15 = \frac{30}{25} = \frac{6}{5} = 1\frac{1}{5}$ hl
b.) 8 konja treba za 1 dan $8 \times \frac{2}{25}$, a za 35 dana 35 puta toliko. Dakle $\frac{16}{25} \times 35 = \frac{112}{5} = 22\frac{2}{5}$ hl.

11.) $32\frac{2}{5} + 29\frac{3}{4} \times 120 = 32\frac{2}{5} + 3480\frac{360}{4} = 32\frac{2}{5} + 3570 = 3602\frac{2}{5}$ l

12.) $53\frac{3}{20} \times 24 = 1272\frac{72}{20} = 1275\frac{12}{20} = 1275\frac{3}{5}$ K

§ 29. Dijeljenje razlomaka s cijelim brojevima.

1.) a.) $\frac{10}{13} : 5 = \frac{2}{13}$; b.) $\frac{9}{10} : 3 = \frac{3}{10}$;
c.) $\frac{16}{5} : 4 = \frac{4}{5}$; d.) $\frac{63}{100} : 9 = \frac{7}{100}$;

2.) a.) $\frac{3}{4} : 2 = \frac{3}{8}$; b.) $\frac{5}{6} : 3 = \frac{5}{18}$
c.) $\frac{16}{15} : 5 = \frac{16}{75}$; d.) $\frac{8}{13} : 3 = \frac{8}{39}$
e.) $\frac{14}{17} : 21 = \frac{2}{17} : 3 = \frac{2}{51}$

3.) a.) $3\frac{5}{7} : 5 = \frac{26}{7} : 5 = \frac{26}{35}$
b.) $12\frac{3}{5} : 7 = \frac{63}{5} : 7 = \frac{9}{5}$
c.) $12\frac{6}{7} : 2 = 6\frac{3}{7}$
d.) $100\frac{5}{8} : 5 = 20\frac{1}{8}$

4.) a.) $26\frac{2}{3} : 5 = \frac{80}{3} : 5 = \frac{16}{3}$
b.) $244\frac{11}{4} : 24 = \frac{7224}{5} : 24 = \frac{57}{5} = 10\frac{1}{5}$
c.) $433\frac{1}{3} : 100 = \frac{1300}{3} : 100 = \frac{13}{3} = 4\frac{1}{3}$
d.) $60\frac{1}{2} : 11 = \frac{121}{2} : 11 = \frac{11}{2} = 5\frac{1}{2}$

5.) a.) polovina od $\frac{1}{3} = \frac{1}{2} : 2 = \frac{1}{4}$
-11- -11- $\frac{1}{3} = \frac{1}{3} : 2 = \frac{1}{6}$

polovina od $\frac{1}{4} = \frac{1}{4} : 2 = \frac{1}{8}$

" " $\frac{1}{5} = \frac{1}{5} : 2 = \frac{1}{10}$

b.) tretina od $\frac{1}{2} = \frac{1}{2} : 3 = \frac{1}{6}$

" " $\frac{1}{4} = \frac{1}{4} : 3 = \frac{1}{12}$

" " $\frac{1}{5} = \frac{1}{5} : 3 = \frac{1}{15}$

6.) a) $1\frac{1}{3} : 5 = \frac{4}{3} : 5 = \frac{4}{15}$

b.) $2\frac{5}{6} : 3 = \frac{17}{6} : 3 = \frac{17}{18}$

c.) $5\frac{5}{12} : 6 = \frac{65}{12} : 6 = \frac{65}{72}$

d.) $7\frac{2}{3} : 8 = \frac{23}{3} : 8 = \frac{23}{24}$

7.) $74\frac{1}{2} : 31 = \frac{149}{2} : 31 = \frac{149}{62} = 2\frac{25}{62}$ K stejných kg

8.) $184\frac{4}{5} : 24 = \frac{924}{5} : 24 = \frac{101}{5} = 20\frac{1}{5}$

9.) $14\frac{1}{2} : 5 = \frac{29}{2} : 5 = \frac{29}{10} = 2\frac{1}{10}$ dana

10.) $o\,35\frac{3}{5} : 6 = 105 + 5\frac{3}{5} : 6 = 105 + \frac{28}{5} : 6 = 105\frac{28}{30} = 105\frac{14}{15}$

11.) $36\frac{4}{5} : 8 = 4 + 4\frac{4}{5} : 8 = 4 + \frac{24}{5} : 8 = 4\frac{3}{5}$

12. Za 1 nesjelu prišledi $21\frac{3}{5} : 9 = 2 + 3\frac{3}{5} : 9 = 2 + \frac{18}{5} : 9 = 2\frac{2}{5}$ K. Za godinu dana prišledi dakle $2\frac{2}{5} \times 52 = 104\frac{104}{5} = 124\frac{4}{5}$ K.

§ 30. Množenje razlomkom.

1.) a) $7 \times \frac{2}{3} = \frac{14}{3}$; b.) $6 \times \frac{4}{9} = \frac{24}{9} = \frac{8}{3}$;

c.) $10 \times \frac{2}{5} = 4$; d.) $208 \times \frac{11}{20} = \frac{2288}{20}$

e.) $36 \times \frac{4}{9} = 16$

2.) a.) $6 \times 1\frac{5}{6} = 6 \times \frac{11}{6} = \frac{66}{6} = 11$

b.) $24 \times 2\frac{3}{8} = 24 \times \frac{19}{8} = 57$

c.) $28 \times 3\frac{4}{7} = 28 \times \frac{25}{7} = 100$

d.) $35 \times \frac{4}{15} = 7 \times \frac{4}{3} = \frac{28}{3}$

e.) $42 \cdot 1\frac{1}{35} = 42 \cdot \frac{36}{35} = 6 \cdot \frac{36}{35} = \frac{216}{5} = 43\frac{1}{5}$

f.) $45 \cdot 10\frac{7}{22} = 45 \cdot \frac{227}{22} = \frac{10215}{22} = 464\frac{7}{22}$

3.) $\frac{2}{8} \cdot \frac{3}{4} = \frac{3}{16}$; b.) $\frac{9}{10} \cdot \frac{5}{6} = \frac{3}{4}$

c.) $\frac{24}{25} \cdot \frac{5}{8} = \frac{3}{5}$; d.) $\frac{3}{8} \times \frac{22}{33} = \frac{1}{11}$

e.) $\frac{52}{43} \cdot \frac{17}{26} = \frac{34}{43}$

4.) a.) $5\frac{5}{6} \cdot \frac{3}{8} = \frac{35}{6} \cdot \frac{3}{8} = \frac{35}{16}$

b.) $8\frac{3}{4} \cdot \frac{3}{4} = \frac{35}{4} \cdot \frac{3}{4} = \frac{105}{16}$

c.) $12\frac{1}{2} \cdot \frac{4}{5} = \frac{25}{2} \cdot \frac{4}{5} = 10$

d.) $7\frac{5}{8} \cdot \frac{4}{5} = \frac{61}{8} \cdot \frac{4}{5} = \frac{61}{10}$

e.) $16\frac{1}{2} \cdot \frac{5}{11} = \frac{33}{2} \cdot \frac{5}{11} = \frac{15}{2}$

5.) a.) $5\frac{2}{3} \cdot 1\frac{3}{4} = \frac{17}{3} \cdot \frac{7}{4} = \frac{119}{12}$

b.) $1\frac{2}{3} \cdot 1\frac{1}{5} = \frac{5}{3} \cdot \frac{6}{5} = 2$

c.) $8\frac{2}{3} \cdot 2\frac{5}{6} = \frac{26}{3} \cdot \frac{17}{6} = \frac{221}{9}$

d.) $36\frac{5}{6} : 28\frac{1}{2} = \frac{221}{6} : \frac{57}{2} = \frac{4199}{4}$

e.) $12\frac{5}{6} : 19\frac{5}{8} = \frac{77}{6} \cdot \frac{157}{8} = \frac{12089}{48}$

6.) a.) $\frac{1}{2} \cdot \frac{1}{3} \cdot \frac{1}{4} = \frac{1}{24}$; b.) $\frac{4}{9} \cdot \frac{5}{6} \cdot \frac{2}{3} = \frac{20}{81}$;

c.) $1\frac{1}{3} \times \frac{6}{7} \times 2\frac{5}{8} = \frac{4}{3} \cdot \frac{6}{7} \cdot \frac{21}{8} = 3$

d.) $\frac{2}{5} \cdot \frac{3}{8} \cdot \frac{4}{9} \cdot \frac{6}{7} = \frac{2}{35}$

e.) $2\frac{1}{3} \cdot 1\frac{3}{4} \cdot 1\frac{1}{9} \cdot 2\frac{2}{5} = \frac{7}{3} \cdot \frac{7}{4} \cdot \frac{10}{9} \cdot \frac{12}{5} = \frac{980}{81}$

f.) $1\frac{1}{3} \cdot 4\frac{1}{5} \cdot 6\frac{2}{9} \cdot 5\frac{1}{3} = \frac{4}{3} \cdot \frac{21}{5} \cdot \frac{56}{9} \cdot \frac{16}{3} = \frac{26656}{135}$

7.) a.) $5 \cdot 3\frac{1}{7} = 5 \cdot \frac{22}{7} = \frac{110}{7}$

b.) $12 \cdot 3\frac{1}{7} = 12 \cdot \frac{22}{7} = \frac{264}{7}$

c.) $9 \cdot 3\frac{1}{7} = 9 \cdot \frac{22}{7} = \frac{198}{7}$

d.) $7 \cdot 3\frac{1}{7} = 7 \cdot \frac{22}{7} = 22$

e.) $28 \cdot 3\frac{1}{7} = 28 \cdot \frac{22}{7} = 88$

8.) Iz zadatka 7. slijedi, da je opseg kruga po prilici $6\frac{2}{7}$ ($2 \times 3\frac{1}{2}$) puta veći od polumjera kruga.

a.) $7\frac{1}{2} \cdot 6\frac{2}{7} = \frac{15}{2} \cdot \frac{44}{7} = \frac{330}{7} = 47\frac{1}{7}$

b.) $5\frac{1}{2} \cdot 6\frac{2}{7} = \frac{11}{2} \cdot \frac{44}{7} = \frac{242}{7} = 34\frac{4}{7}$

c.) $12\frac{1}{2} \cdot 6\frac{2}{7} = \frac{25}{2} \cdot \frac{44}{7} = \frac{550}{7} = 78\frac{4}{7}$

9.) a.) $2\frac{1}{2} \cdot 8\frac{3}{5} = \frac{5}{2} \cdot \frac{43}{5} = \frac{43}{2} = 12\frac{1}{2}$ K

b.) $3\frac{5}{8} \cdot 8\frac{3}{5} = \frac{29}{8} \cdot \frac{43}{5} = \frac{1247}{40} = 31\frac{7}{40}$

c.) $6\frac{3}{4} \cdot 8\frac{3}{5} = \frac{27}{4} \cdot \frac{43}{5} = \frac{1161}{20} = 58\frac{1}{20}$

10.) 1. m sloji $7\frac{1}{2}$ K

2. m sloji $1\frac{1}{2}$ puta prvi $= 1\frac{1}{2} \cdot 7\frac{1}{2} =$
$= \frac{3}{2} \cdot \frac{15}{2} = \frac{45}{4} = 11\frac{1}{4}$ K

3. m sloji $1\frac{1}{2}$ puta drugi $= 1\frac{1}{2} \cdot 7\frac{1}{2} \cdot 1\frac{1}{2} =$
$= \frac{3}{2} \cdot \frac{15}{2} \cdot \frac{3}{2} = \frac{135}{8} = 16\frac{7}{8}$

4. m sloji $1\frac{1}{2}$ puta treći $=$
$= 1\frac{1}{2} \cdot 7\frac{1}{2} \cdot 1\frac{1}{2} \cdot 1\frac{1}{2} = \frac{3}{2} \cdot \frac{15}{2} \cdot \frac{3}{2} \cdot \frac{3}{2} = \frac{405}{16} = 25\frac{5}{16}$

5. m sloji $1\frac{1}{2}$ puta četvrti $=$
$= 1\frac{1}{2} \cdot 7\frac{1}{2} \cdot 1\frac{1}{2} \cdot 1\frac{1}{2} \cdot 1\frac{1}{2} = \frac{3}{2} \cdot \frac{15}{2} \cdot \frac{3}{2} \cdot \frac{3}{2} \cdot \frac{3}{2} = \frac{1215}{32} = 37\frac{31}{32}$

Kopanje cijeloga kanala stoji dakle:

$7\frac{1}{2} + \frac{45}{4} + \frac{135}{8} + \frac{405}{16} + \frac{1215}{32} = \frac{240}{32} + \frac{360}{32} +$
$+ \frac{540}{32} + \frac{810}{32} + \frac{1215}{32} = \frac{3165}{32} = 98\frac{29}{32}$ K

11.) $634\frac{3}{4} \cdot 9\frac{3}{5} = \frac{2539}{4} \cdot \frac{48}{5} = \frac{40624}{5} = 8124\frac{4}{5}$ K

12.) Da voda iz posude kroz drugu cijev ne ističe, bilo bi u posudi iza $1\frac{3}{4}$ h $(52\frac{3}{8} + 1\frac{3}{4} \cdot 682\frac{3}{4})$ l vode. Kroz drugu cijev otječe za $1\frac{3}{4}$ h $687\frac{4}{5} \cdot 1\frac{3}{4}$ l vode. Iza $1\frac{3}{4}$ h nalazi se dakle u posudi u višku: $52\frac{3}{8} + 1\frac{3}{4} \cdot 682\frac{3}{4} - 687\frac{4}{5} \cdot 1\frac{3}{4} =$
$= 52\frac{3}{8} + \frac{7}{4} \cdot \frac{2731}{4} - \frac{3439}{5} \cdot \frac{7}{4} = 52\frac{3}{8} +$
$+ \frac{19117}{16} - \frac{24073}{20} = 52\frac{3}{8} + 1194\frac{13}{16} - 1203\frac{13}{20} =$
$= 43\frac{3}{8} + \frac{13}{16} - \frac{13}{20} = 43\frac{30}{80} + \frac{65}{80} - \frac{52}{80} =$
$= 43\frac{43}{80}$ l vode.

13.) Dobitak od svakog kg: prve vrste $=$
$= 2\frac{4}{5} - 2\frac{1}{4} = \frac{4}{5} - \frac{1}{4} = \frac{16}{20} - \frac{5}{20} = \frac{11}{20}$ K;
... druge vrste $= 2\frac{4}{5} - 2\frac{7}{10} = \frac{4}{5} - \frac{7}{10} =$
$= \frac{16}{20} - \frac{14}{20} = \frac{2}{20} = \frac{1}{10}$ K; treće vrste $=$
$2\frac{4}{5} - 2\frac{1}{2} = \frac{4}{5} - \frac{2}{2} = \frac{8}{10} - \frac{5}{10} = \frac{3}{10}$ i

Na $123\frac{1}{2}$ kg prve vrste dobije dakle:
$123\frac{1}{2} \cdot \frac{11}{20} = \frac{247}{2} \cdot \frac{11}{20} = \frac{2717}{40} = 67\frac{37}{40}$ K

Na $183\frac{3}{4}$ kg druge vrste dobije:
$183\frac{3}{4} \cdot \frac{1}{10} = \frac{735}{4} \cdot \frac{1}{10} = \frac{735}{40} = 18\frac{15}{40}$ K

Na 150 kg treće vrste dobije:
$150 \cdot \frac{3}{10} = 15 \cdot 3 = 45$ K.

U svemu dobije: $67\frac{37}{40} + 18\frac{15}{40} + 45 =$
$= 130\frac{52}{40} = 131\frac{12}{40} = 131\frac{3}{10}$ K.

§ 31. Dijeljenje razlomkom.

1.) a.) $12 : \frac{1}{2} = 24$; b.) $42 : \frac{7}{10} = 6 : \frac{1}{10} = 60$

c.) $5 : 3\frac{2}{3} = 5 : \frac{11}{3} = \frac{15}{11}$;

d.) $46 : 5\frac{3}{4} = 46 : \frac{23}{4} = 2 : \frac{1}{4} = 8$

e.) $57 : 6\frac{8}{15} = 57 : \frac{98}{15} = 57 \cdot \frac{15}{98} = \frac{855}{98}$

2.) a.) $\frac{1}{2} : \frac{3}{8} = 1 : \frac{3}{4} = \frac{4}{3}$; b.) $\frac{9}{14} : \frac{7}{9} = \frac{81}{98}$

c.) $\frac{13}{15} : \frac{5}{12} = \frac{156}{75}$; d.) $\frac{17}{18} : \frac{5}{6} = \frac{17}{3} : 5 = \frac{17}{15}$

3.) a.) $3\frac{2}{3} : 1\frac{1}{2} = \frac{11}{2} : \frac{3}{2} = 11 : 3 = \frac{11}{3}$;

b.) $4\frac{1}{2} : 3\frac{3}{4} = \frac{9}{2} : \frac{15}{4} = 9 : \frac{15}{4} = 3 : \frac{5}{2} = \frac{6}{5}$

c.) $7\frac{1}{5} : 5\frac{2}{3} = \frac{36}{5} : \frac{17}{3} = \frac{108}{85}$

d.) $5\frac{3}{4} : 7\frac{5}{6} = \frac{23}{4} : \frac{47}{6} = \frac{23}{2} : \frac{47}{3} = \frac{69}{94}$

e.) $26\frac{7}{38} : 8\frac{40}{57} = \frac{995}{38} : \frac{448}{57} = \frac{56745}{17024}$

4.) $7 : \frac{3}{4} = \frac{28}{3}$

5.) $210 : 4\frac{3}{8} = 210 : \frac{35}{8} = 6 : \frac{1}{8} = 48$ pari

6.) $3047 : 2\frac{3}{4} = 3047 : \frac{11}{4} = 277 : \frac{1}{4} = 1108$ K

7.) a.) $9\frac{3}{4} : 20\frac{1}{2} = \frac{39}{4} : \frac{41}{2} = \frac{39}{2} : 41 = \frac{39}{82}$ m

b.) Za 2 K dobije se dvapuť toliko $\frac{39}{82} \cdot 2 = \frac{39}{41}$ m

c.) $\frac{39}{82} \cdot 24 = \frac{39}{41} \cdot 12 = \frac{468}{41} = 11\frac{17}{41}$ m

8.) a.) $611\frac{4}{5} : 4\frac{3}{5} = \frac{3059}{5} : \frac{23}{5} = \frac{3059}{23} = 133$

b.) $57 : 1\frac{1}{2} = 57 : \frac{3}{2} = 19 : \frac{1}{2} = 38$

9.) $37\frac{5}{16} - 11\frac{3}{5} = 26\frac{25}{80} - \frac{48}{80} = 25\frac{105}{80} - \frac{48}{80} = 25\frac{57}{80}$

$28\frac{7}{15} - 19\frac{7}{12} = 9\frac{28}{60} - \frac{35}{60} = 8\frac{88}{60} - \frac{35}{60} = 8\frac{53}{60}$

$25\frac{57}{80} : 8\frac{53}{60} = \frac{2057}{80} : \frac{533}{60} = \frac{2057}{4} : \frac{533}{3} = \frac{6171}{2132} = 2\frac{1907}{2132}$

10.) $348 : 2\frac{3}{4} = 348 : \frac{11}{4} = \frac{992}{11} = 90\frac{2}{11}$ K na godinu.

11.) a.) 1 radnik zasluži $26\frac{3}{4} : 8 = \frac{107}{4} : 8 = \frac{107}{32} = 3\frac{11}{32}$ K na dan

b.) 2 radnika zasluže $3\frac{11}{32} \cdot 2 = 6\frac{11}{16}$ K na dan.

c.) 3 radnika zasluže $3\frac{11}{32} \cdot 3 = 9\frac{33}{32} = 10\frac{1}{32}$ K na dan.

d.) 5 radnika zasluže $3\frac{11}{32} \cdot 5 = 15\frac{55}{32} = 16\frac{23}{32}$ K na dan.

e.) 12 radnika zasluže $3\frac{11}{32} \cdot 12 = 36\frac{33}{8} = 40\frac{1}{8}$ K na dan.

12.) Na svaki hl otpada $204\frac{3}{4} : 15\frac{3}{4} = \frac{819}{4} : \frac{63}{4} = \frac{819}{63} = 13$ K dobitka. Ukupno je dakle hl prodavao po $57\frac{1}{2} + 13 = 64\frac{1}{2}$ K.

13.) $\frac{5}{7} : \frac{3}{8} = \frac{40}{21} = 1\frac{19}{21}$

15.) $661\frac{1}{2} : 6\frac{3}{4} = \frac{1323}{2} : \frac{27}{4} = 1323 : \frac{27}{2} = 147 : \frac{3}{2} = 49 : \frac{1}{2} = 98$ svjetiljaka.

16.) $3574\frac{1}{5} : 16 = \frac{178576}{5} : 16 = \frac{11161}{5} = 2232\frac{1}{5}$ K (za dobrodošle sobe). Za sinove ostaje dakle (zajedno): $3574\frac{1}{5} - 2232\frac{1}{5} = 33483$ K; $33483 \cdot \frac{2}{5} = \frac{66966}{5} = 13393\frac{1}{5}$ K = dobije najstariji brat. Oba mlađa brata dobiju zajedno $33483 - 13393\frac{1}{5} = 20090 - \frac{1}{5} = 20089\frac{4}{5}$ K. Budući da dvojica dobiju jednake dijelove, dobije svaki polovinu preostale svote. Svaki od mlađe braće dobije dakle svaki $20089\frac{4}{5} : 2 = 10044\frac{2}{10}$ K

17.) Kupio je sladora za polovicu zadane svote 5. j. $57\frac{3}{5} : 2 = 28\frac{7}{5}$ K. Za istu svotu kupio je kave. Za $28\frac{7}{5}$ K dobio je dakle: $28\frac{7}{5} : \frac{18}{25} = \frac{147}{5} : \frac{18}{25} = 147 : \frac{18}{5} = 8 : \frac{1}{5} =$ = 40 kg sladora. Za $28\frac{7}{5}$ K dobio je $28\frac{7}{5} : 3\frac{1}{5} = \frac{147}{5} : \frac{16}{5} = 147 : 16 = 9$ kg kave.

18.) U jednom komadu platna ima $\frac{73\frac{1}{4} - 3\frac{1}{4}}{2} = 35$ m platna. U drugom za $3\frac{1}{4}$ m više, dakle $35 + 3\frac{1}{4} = 38\frac{1}{4}$. Ili: $73\frac{1}{4} - 35 = 38\frac{1}{4}$ m; $3\frac{1}{4}$ m platna stoji $4\frac{1}{2}$ K. 1 m stoji dakle $4\frac{1}{2} : 3\frac{1}{4} = \frac{9}{2} : \frac{13}{4} = 9 : \frac{13}{2} = \frac{18}{13} = 1\frac{5}{13}$ K. Prvi komad platna stoji potome: $35 \cdot 1\frac{5}{13} = 35 \cdot \frac{18}{13} = \frac{630}{13} = 48\frac{6}{13}$ K, a drugi komad platna: $38\frac{1}{4} \cdot 1\frac{5}{13} = \frac{153}{4} \cdot \frac{18}{13} = \frac{153}{2} \cdot \frac{9}{13} = \frac{1377}{26} = 52\frac{25}{26}$ K

§. 32. Međusobni odnošaj prostih razlomaka i decimalnih brojeva.

Vježbe I.

Pretvaranje prostih razlomaka u decimalni broj.

1.) a.) $\frac{1}{2} = 1 : 2 = 0{\cdot}5$; b.) $\frac{3}{4} = 3 : 4 = 0{\cdot}75$

c.) $\frac{5}{8} = 5 : 8 = 0{\cdot}625$; d.) $\frac{27}{32} = 27 : 32 = 0{\cdot}84375$

e.) $\frac{52}{54} = \frac{26}{27} = 26 : 27 = 0{\cdot}\dot{9}6\dot{2}$

f.) $\frac{92}{132} = \frac{9}{46} = 9 : 46 = 0{\cdot}19565217$

g.) $3\frac{7}{10} = 3{\cdot}35$ h.) $8\frac{6}{25} = 8{\cdot}24$; i.) $13\frac{5}{32} = 13{\cdot}$

g.) $\frac{8}{33} = 0{\cdot}\dot{2}\dot{4}$; h.) $\frac{31}{33} = 0{\cdot}\dot{9}\dot{3}$; i.) $\frac{1}{99} = 0{\cdot}\dot{0}\dot{1}$

k.) $\frac{37}{99} = 0{\cdot}\dot{3}\dot{7}$

Vježbe II.

Pretvaranje decimalnih brojeva u razlomke.

1.) Dobije se jedanaestorik broja 7 t. j. sam broj 7.

2.) Dobije se 8-mo kratnik zadanog broja.

3.) " " 99-tero " " "

Vježbe III.

1.) a.) $0{\cdot}\dot{7} = \frac{7}{9}$, b.) $0{\cdot}\dot{3}4\dot{5} = \frac{345}{999} = \frac{115}{333}$

c.) $2{\cdot}\dot{3}\dot{6} = 2\frac{36}{99} = 2\frac{4}{11}$;

d.) $8{\cdot}\dot{0}\dot{1} = 8\frac{1}{99}$; e.) $3{\cdot}\dot{9} = 3\frac{9}{9} = 4$

2.) a.) $0{\cdot}92 \cdot 0{\cdot}\dot{5}\dot{6} = \frac{92}{100} \cdot \frac{56}{99} = \frac{23}{25} \cdot \frac{56}{99} = \frac{1288}{2475}$

b.) $8\frac{1}{3} \cdot 2{\cdot}6\dot{2}\dot{1} = \frac{25}{3} \cdot 2\frac{621}{999} = 25 \cdot \frac{2619}{333} =$

$= 25 \cdot \frac{291}{37} = \frac{7275}{37} = 196\frac{23}{37}$

c.) $5{\cdot}8 \cdot 1{\cdot}\dot{9} = 5\frac{8}{9} \cdot 1\frac{9}{9} = 5\frac{8}{9} \cdot 2 = 10\frac{16}{9} = 11\frac{7}{9}$

3.) a.) $7{\cdot}4 : 2{\cdot}3 = 7\frac{4}{9} : 2\frac{3}{9} = \frac{67}{9} : \frac{21}{9} = \frac{67}{21} = 3\frac{4}{21}$

b.) $2{\cdot}\dot{9} : 0{\cdot}0\dot{9} = 2\frac{9}{9} : \frac{9}{99} = 3 : \frac{1}{11} = 33$

Vježbe IV.

Decimalni je broj nečist periodičan.

1.) a.) $0{\cdot}2\dot{7} = \frac{27-2}{90} = \frac{25}{90} = \frac{5}{18}$

b.) $0{\cdot}54\dot{5} = \frac{545-5}{990} = \frac{540}{990} = \frac{6}{11}$

c.) $3{\cdot}3\dot{1}2\dot{3} = 3\frac{3123-3}{9990} = 3\frac{3120}{9990} = 3\frac{104}{111}$

d.) $4{\cdot}07\dot{2} = 4\frac{72-0}{990} = 4\frac{72}{990} = 4\frac{8}{110} = 4\frac{4}{55}$

e.) $1{\cdot}000\dot{1} = 1\frac{1}{9900}$ i f.) $0{\cdot}8\dot{9} = \frac{89-8}{90} = \frac{81}{90} = \frac{9}{10}$

g.) $2{\cdot}08\dot{9} = 2\frac{89-8}{900} = 2\frac{80}{900} = 2\frac{8}{100}$

h.) $0{\cdot}1\dot{9} = \frac{19-1}{90} = \frac{18}{90} = \frac{1}{5}$

i.) $1{\cdot}00\dot{9} = 1\frac{9}{900} = 1\frac{1}{100}$

2.) a.) $0{\cdot}92 \cdot 0{\cdot}25\dot{6} = \frac{92}{100} \cdot \frac{256-2}{990} = \frac{23}{25} \cdot \frac{254}{990} = \frac{5842}{24750}$

b.) $13{\cdot}42\dot{7} \cdot 1{\cdot}00\dot{6}\dot{9} = 13\frac{427-42}{900} \cdot 1\frac{69-6}{9000} =$

$= 13\frac{385}{900} \cdot 1\frac{63}{9000} = 13\frac{77}{180} \cdot 1\frac{7}{1000} = \frac{2417}{180} \cdot \frac{1007}{1000} =$

$= \frac{2433919}{180000} = 13\frac{93919}{180000}$

3.) a.) $5{\cdot}24\dot{7} : 3{\cdot}20\dot{9} = 5\frac{247-24}{900} : 3\frac{209-20}{900} =$

$5\frac{223}{900} : 3\frac{189}{900} = \frac{4723}{900} \cdot \frac{2889}{900} = \frac{4723}{2889}$

b.) $8 : 2{\cdot}07\dot{3} = 8 : 2\frac{73-7}{900} = 8 : 2\frac{66}{900} = 8 : 2\frac{11}{150} =$

$= 8 : \frac{311}{150} = \frac{1200}{311} = 3\frac{267}{311}$

c.) $6{\cdot}3 : 2{\cdot}64\dot{5} = 6\frac{3}{9} : 2\frac{645-6}{990} = 6\frac{1}{3} : 2\frac{639}{990} =$

$= 6\frac{1}{3} : 2\frac{71}{110} = \frac{19}{3} : \frac{291}{110} = \frac{2090}{873} = 2\frac{344}{873}$

Zaključni račun.

§33. I. Prosti zaključni račun.

1) Za 3 kg plaća se 6 K
" 4 " " " 8 K
" 7 " " " 14 K

2.) Set puta toliko. $18{\cdot}5 \cdot 5 = 92{\cdot}5$ K

3.) Osam puta toliko. $3{\cdot}240 \cdot 8 = 25{\cdot}920$ Km

4.) Osam puta manje dana. $32 : 8 = 4$ dana.

5.) Za tri puta kraće vrijeme t. j. za 2 sata.

6.) Za pet puta manje dana tj. 9 dana.

7.) a.) 2 puta manje t. j. 2·5 m
b.) 2·5 " " " 2 m
c.) 1·3 " " " $5 : \frac{13}{10} = \frac{50}{13} = 3\frac{11}{13}$ m
d.) 0·8 " " " $5 : 0{\cdot}8 = 6{\cdot}25$ m

8.) a.) Za 7 puta kraće vrijeme tj. za 4 dana
b.) " $3\frac{1}{2}$ " " " " " $28 : 3\frac{1}{2} = 8$ dana

9.) Izrađen u knjizi.

10.) 1 ha stoji $\frac{4320}{8} = 540$ K

11.) 13 puta toliko tj. 65 dana.

12.) 15 puta manje tj. $\frac{480}{15} = 32$ puta

13.) Za 4 puta duže vrijeme tj. $16\frac{3}{4} \cdot 4 = 67$ sati

14.) $9 : 4{\cdot}5 = 2$ kg

B.

1.) Izrađen u knjizi.

2.) a.) Za 2 puta kraće vrijeme tj. $8\frac{1}{2}$ dana
b.) " 4 " " " " $4\frac{1}{4}$ "
c.) " 3 " " " " $5\frac{2}{3}$ "
d.) " 3 " duže " " 51 dan

3.) a.) 2 puta više tj. 24 pisara
b.) 4 " " " 48 "
c.) 2 " manje " 6 "

4.) a.) 3 puta toliko t.j. $540 \cdot 3 = 1620$
b.) 5 " " " $540 \cdot 5 = 2700$

5.) a.) 2 puta manje t.j. $72 \cdot 4 : 2 = 36 \cdot 2$ Km
b.) 3 " više " $72 \cdot 4 \cdot 3 = 217 \cdot 2$ Km

6.) 3 puta manje dana t.j. $12 : 3 = 4$ dana

7.) Kroz 45 nedelja moći će hraniti 3 puta manje krava t.j. 3 krave. Po tome mora da proda 6 krava.

C

1.) Izvrsjen u knjizi.

2.) 1 m stoji $\frac{7 \cdot 20}{6} = 1 \cdot 20$ K
5 " " $12 \cdot 5 = 6 \cdot 00$ K
6·5 " " $12 \cdot 6 = 7 \cdot 80$ K
8 " " $12 \cdot 8 = 9 \cdot 60$ K
0·72 " " $12 \cdot 0 \cdot 72 = 0 \cdot 86$ K

3.) Za 1 K dobije se $27\frac{2}{5} : 73 = \frac{137}{5} : 73 = \frac{137}{365}$ m sukna
Za 285 K 285 puta toliko t.j: $\frac{137}{365} \cdot 285 = 106\frac{71}{73}$ m.

4.) 24 min = 1440 sek.
Za 24 min prevaliti će zvuk $\frac{1440}{5}$ puta toliki put kao za 5 sek t.j: $1665 \cdot 288 =$
$= 479520$ m $= 479 \cdot 520$ Km

5.) Iz pregjašnjeg zadatka slijedi, da zvuk u svakoj sekundi prevali $\frac{1665}{5} =$
333 m. Za put od 7·585936 Km = 7585·936 m trebaće dakle $7585 \cdot 936 : 333 = 22 \cdot 78$ sek.

6.) Za 1 sat pregje $\frac{19}{5}$ Km. Za $7\frac{25}{60}$ sata pregje $\frac{19}{5} \cdot 7\frac{25}{60} = \frac{19}{5} \cdot 7\frac{5}{12} = \frac{19}{5} \cdot \frac{89}{12} = \frac{1691}{60} = 28\frac{11}{60}$ Km

7.) Za 1 Km treba $\frac{4}{13}$ sata. Za 45 Km 45 puta toliko
$\frac{4}{13} \cdot 45 = \frac{180}{13} = 13\frac{11}{13}$ sata.

8.) Potrošiti će na godinu $\frac{365}{16}$ puta po 5 K sladora
$\frac{365}{16} \cdot 5 = 114\frac{1}{16}$ kg

9.) Za 1 ha treba $\frac{7}{13}$ sata.
Za 58 ha 58 puta toliko. $58 \cdot \frac{7}{13} = 31\frac{3}{13}$ sata.

10.) Dok se stražnji okrene 1 put okrene se prednji: $\frac{24}{18}$
" " " " 135 " " " 135 puta više
$135 \cdot \frac{24}{18} = 15 \cdot \frac{24}{2} = 15 \cdot 12 = 180$ puta.

11.) Razdijeljena svota iznosi $9 \cdot 12 = 108$ K
Ako ima 18 osoba dobije svaka $\frac{108}{18} = 6$ K

12.) Za 1 met. centa plati $\frac{27}{24}$ K. Za 88 met. centi
88 puta toliko: $\frac{27}{24} \cdot 88 = \frac{27}{3} \cdot 11 = 9 \cdot 11 = 99$ K

13.) Za 1 min. ističe $\frac{392}{18}$ l vode. Za 30 min
30 puta toliko: $\frac{392}{18} \cdot 30 = \frac{392}{3} \cdot 5 = 653\frac{1}{3}$ l

14.) Kupio je onaj bolje, koji je jeftinije platio:
Prvi je kupio 1 m robe za $\frac{10 \cdot 44}{4 \cdot 5} = 2 \cdot 32$ K
Drugi " " " " " $\frac{7 \cdot 30}{3 \cdot 12} = 2 \cdot 34$ K
Prvi je dakle kupio bolje.

15.) Dugu je mu $400 + 4 \cdot 6 \cdot 30 = 425 \cdot 20$ K

16.) " " $635 + 6 \cdot 35 \cdot 4 \cdot 5 = 663 \cdot 575$ K

17.) Da se posao svrši za 1 dan, trebalo bi raditi $9 \cdot 108$ sati na dan. Budući ga treba svršiti za 81 dan treba raditi 81 put manje t.j $\frac{9 \cdot 108}{81} = \frac{108}{9} = 12$ sati.

18.) Po uputi u knjizi (31 rasnik)

19.) Prvi radnik zasluži za 1 dan $\frac{42}{14} = 3$ K
Za pet dana zasluži dakle $5 \cdot 3 = 15$ K
Ako drugi radnik zaradi tu svotu

isto m za 6 dana zaradi on na dan $\frac{15}{6} = \frac{5}{2} = 2{\cdot}5$ K, a u 14 dana $14.2{\cdot}5 = 35$ K

20.) Po uputi u knjizi.

$\frac{36}{36} : \frac{5}{36} = \frac{36}{5} = 7\frac{1}{5}$ dana

21.) Dobiće $\frac{425}{250}$ puta po 19·40 K =

$= 1{\cdot}7.\ 19{\cdot}40 = 32{\cdot}98$ K

22.) Na 240 K = 2·4 stotine K dobio je

288 − 240 = 48 K. Na 1 stotini dobio je

dakle $\frac{48}{2{\cdot}4} = 20$ K

D

1. i 2. izraqjeni u knjizi.

3.) 3·4 radnika trebaju 15 dana

4 " " $3.15 = 45$ "

16 radnika = 4·4 radnika trebaju 4 puta

manje nego 4 radnika t.j: $\frac{45}{4} = 11\frac{1}{4}$ dana

4.) Ako se radi 3.12 dana, treba raditi 9h na dan

" " " 12 " " " 3.9^h " "

" " " 2.12 " " " $\frac{3.9}{2} = \frac{27}{2} = 13\frac{1}{2}^h$ " "

5.) Za 15.3 K vozi 25 Km daleko

" 3 K " $\frac{25}{15} = \frac{5}{3}$ Km "

" 14.3 K " $14.\frac{5}{3} = 23\frac{1}{3}$ Km "

Drugi način: Za manju cijenu vozi će

manji put. Budući je u zadatku

razlika u cijeni 3 K (45 − 42 = 3) to će

vozač voziti za onoliko km manje,

koliko otpada na 3 K. Na 3 K pak

otpad $\frac{5}{3}$ km. Po tome će vozač

odvesti teret samo na $25 - \frac{5}{3} = 23\frac{1}{3}$ km

daljine.

6.) 5.160 ljudi živi 3 mjeseca

160 " " 5.3 = 15 "

4.160 " " $\frac{15}{4} = 3\frac{3}{4}$ "

7.) $\frac{1}{2}$ kg = 500 g = 5.100 g stoji 26 K

100 g " $\frac{26}{5}$ K

350 g = 3·5.100 g " $3{\cdot}5.\ \frac{26}{5} = 0{\cdot}7.26 = 18{\cdot}2$ K

8.) 4.372 čovjeka potroše na dan 1624 K

372 " " " " $\frac{1624}{4} = 406$ K

1860 = 5.372 " " " " $5.406 = 2030$ K

Primjedba: U knjizi tiskarska pogrješka.

Mjesto 1660 treba da stoji 1860

E

Zadaci izraqjeni u knjizi.

II. Složeni zaključni račun

1.) 15 konja treba za 8 dana 15 hl zobi

1 " " " 8 " $\frac{15}{15}$ " "

1 " " " 1 " $\frac{1}{8}$ " "

24 " " " 1 " $24.\frac{1}{8} = 3$ " "

24 " " " 9 " $9.3 = 27$ " "

2.) Za 9·6 K odveze vozač 180 kg 20 km daleko

" 1 K " " $\frac{180}{9{\cdot}6}$ " " "

" 1 K " " $\frac{180}{9{\cdot}6} \cdot 20$ " 1 Km "

" 12·8 K " " $\frac{180}{9{\cdot}6} \cdot 20 \cdot 12{\cdot}8$ kg 1 Km "

" 12·8 K " " $\frac{\frac{180}{9{\cdot}6} \cdot 20 \cdot 12{\cdot}8}{30} = 160$ kg 30 Km "

3.) 4320 m dug kanal kopa 60 radnika 48 dana

1 m " " " $\frac{60}{4320}$ " 48 "

1 m " " " $\frac{60}{4320} \cdot 48$ " 1 "

3480 m " " " $\frac{60}{4320} \cdot 48 \cdot 3480$ " 1 "

3480 m " " " $\frac{\frac{60}{4320} \cdot 48 \cdot 3480}{20} = 116$ " 20 dana

4.) 8 konja trebа za 15 dana 20 hl

1 " " " 15 " $\frac{20}{8}$ "

1 " " " 1 " $\frac{20}{8} : 15 = \frac{1}{6}$ hl

1 " " " 7 " $7 \cdot \frac{1}{6} = 1\frac{1}{6}$ hl

5.) 6 kg pregje 60 m platna 1·5 m širine

1 " " $\frac{60}{6} = 10$ m " 1·5 " "

1 " " $10 \cdot 1{\cdot}5 = 15$ m " 1 " "

8 " " $15 \cdot 8 = 120$ m " 1 " "

8 " " $\frac{120}{1{\cdot}25} = 96$ m " 1·25 " "

6.) 32 retka po 45 slova 240 strana

1 " " 45·32 " 240 "

1 " " 45·32·240 " 1 "

36 " " $\frac{45 \cdot 32 \cdot 240}{36}$ " 1 "

36 " " $\frac{45 \cdot 32 \cdot 240}{36} : 200 = 48$ slova 200 strana

7.) 4 točka za $10\frac{1}{2}$ sati 1033·2 kg pšenice

1 " " $10\frac{1}{2}$ " $\frac{1033{\cdot}2}{4}$ " "

1 " " 1 " $\frac{1033{\cdot}2}{4} : 10{\cdot}5 = \frac{1033{\cdot}2}{4 \cdot 10{\cdot}5}$ kg "

3 " " 1 " $\frac{1033{\cdot}2}{4 \cdot 10{\cdot}5} \cdot 3$ kg pšenice

3 " " 14 " $\frac{1033{\cdot}2}{4 \cdot 10{\cdot}5} \cdot 3 \cdot 14 = 1033{\cdot}2$ kg "

8.) 36 kg pregje 112 m platna 84 cm širine

1 " " $\frac{112}{36}$ m " 84 " "

1 kg pregje $\frac{112}{36} \cdot 84$ m platna 1 cm širine

27 " " $\frac{112}{36} \cdot 84 \cdot 27$ m " 1 " "

27 " " $\frac{112}{36} \cdot 84 \cdot 27 : 70$ m = 100·8 m platna 70 cm šir.

9.) 12 m dužine 50 cm širine 40 K

1 " " 50 " " $\frac{40}{12}$ K

1 " " 1 " " $\frac{40}{12} : 50 = \frac{40}{12 \cdot 50}$ K

15 " " 1 " " $\frac{40}{12 \cdot 50} \cdot 15$ K

15 " " 60 " " $\frac{40}{12 \cdot 50} \cdot 15 \cdot 60 = 60$ K

10.) 10 radnika 8 dana 10 sati dnevno

10 " 1 " 10 " svrše $\frac{1}{8}$ posla

10 " 1 " 1 " " $\frac{1}{8} : 10 = \frac{1}{80}$ "

---

6 radnika 12 dana 8 sati dnevno

6 " 1 " 8 " " svrše $\frac{1}{12}$ posla

6 " 1 " 1 " " " $\frac{1}{12} : 8 = \frac{1}{96}$ "

Obe grupe svrše dakle za 1 sat $\frac{1}{80} + \frac{1}{96} = \frac{6}{480} + \frac{5}{480} = \frac{11}{480}$ posla

Za koliko sati svršiti će $\frac{480}{480}$ posla tj. sio posao? Svršiti će ga za $\frac{480}{480} : \frac{11}{480} = \frac{480}{11} = 43\frac{7}{11}$ sata. Budući da rade svaki dan $10\frac{3}{4}$ sata, to će sio posao biti u $43\frac{7}{11} : 10\frac{3}{4} = \frac{480}{11} : \frac{43}{4} = \frac{480}{11} \cdot \frac{4}{43} = \frac{1920}{473} = 4\frac{28}{473}$ dana gotov.

Primjedba: napustak u knjizi nije ispravan, jer ne odgovara zadatku. U zadatku se ne govori o „prvom i drugom" dijelu posla, nego o dvjema grupama radnika.

11.) 5 mornara za 3 dana 14 kg
1 " " 3 " $\frac{14}{5}$ "
1 " " 1 " $\frac{14}{5}:3=\frac{14}{15}$ kg
11 " " 1 " $\frac{14}{15}\cdot 11$ kg
11 " " 135 " $\frac{14}{15}\cdot 11\cdot 135=1386$ kg

12.) a.) 120 radnika 10 sati 36 dana
1 " 10 " 36.120 "
1 " 1 " 36.120.10 "
150 " 1 " $\frac{36.120.10}{150}$ "
150 " 9 " $\frac{36.120.10}{150}:9=32$ dana

b.) 36 dana 10 sati 120 radnika
1 " 10 " 36.120 "
1 " 1 " 36.120.10 "
240 " 1 " $\frac{36.120.10}{240}$ "
240 " 12 " $\frac{36.120.10}{240}:12=15$ radnika

c.) 120 radnika 36 dana 10 sati
1 " 36 " 10.120 "
1 " 1 " 10.120.36 "
96 " 1 " $\frac{10.120.36}{96}$ "
96 " 50 " $\frac{10.120.36}{96}:50=9$ sati

13.) 3 čovjeka za 4 dana 38·4 ha
1 " " 12 " 38·4 "
1 " " $\frac{12}{38\cdot4}$ " 1 ha
7 ljudi " $\frac{12}{38\cdot4}:7=\frac{12}{38\cdot4\cdot7}$ dana 1 ha
7 " " $\frac{12}{38\cdot4\cdot7}\cdot 472=21\frac{1}{14}$ " 472 ha

14.) 6 svjetiljaka $4\frac{1}{3}$ sata $40\frac{4}{9}$ K 40 večeri
1 " $4\frac{1}{3}$ " $40\frac{4}{9}$ K 6.40 "
1 " 1 " $40\frac{4}{9}$ K $6.40.4\frac{1}{3}$ "

1 svjetiljka 1 sat 1 K $\frac{6.40.4\frac{1}{3}}{40\frac{4}{9}}$ večeri
8 " 1 " 1 K $\frac{6.40.4\frac{1}{3}}{40\frac{4}{9}}:8=\frac{6.40.4\frac{1}{3}}{8.40\frac{4}{9}}$ "
8 " $6\frac{2}{3}$ h 1 K $\frac{6.40.4\frac{1}{3}}{8.40\frac{4}{9}}:6\frac{2}{3}=\frac{6.40.4\frac{1}{3}}{8.40\frac{4}{9}.6\frac{2}{3}}$ "
8 " $6\frac{2}{3}$ h $43\frac{1}{3}$ K $=\frac{6.40\ 4\frac{1}{3}}{8.40\frac{4}{9}.6\frac{2}{3}}\cdot 43\frac{1}{3}=20{\cdot}89$ večeri.

15.) 35 konj. sila 125 m za 1 sat
1 " " 125 " " 35 "
1 " " 1 " " $\frac{35}{125}$ "
156 " " 1 " " $\frac{35}{125}:156=\frac{35}{125.156}$ sati
156 " " 240 " " $\frac{35}{125.156}\cdot 240=\frac{28}{65}$ "

16.) Izračjen u knjizi

17.) 13·4 m dug 0·7 debeo 2·6 visok 609 opeka
1 " " 1 " " 1 " " $\frac{609}{13\cdot4.0\cdot7.2\cdot6}$ "
9·25 " " 0·8 " " 2·9 " " $\frac{609}{13\cdot4.0\cdot7.2\cdot6}\cdot 9{\cdot}25.0{\cdot}8.2{\cdot}9=$
$=5365$ opeka.

Omjeri i razmjeri

§34. Omjeri.

Vježbe

1.) a.) 6:2 = 3:1; b.) 10:18 = 5:9; c.) 16:12 = 4:3;
d.) 32:24 = 4:3; e.) 56:72 = 7:9; f.) 48:120 = 2:5;
g.) 60:84 = 5:7

2.) a.) $5\frac{2}{7}:3\frac{1}{7}=\frac{37}{7}:\frac{22}{7}=37:22$

b.) $1\frac{5}{8} : 2\frac{1}{6}$
$\frac{13}{8} : \frac{13}{6}$
$\frac{1}{4} : \frac{1}{3}$
$3 : 4$

c.) $\frac{2}{3} : 1$
$2 : 3$

d.) $10 : 3\frac{1}{3}$
$10 : \frac{10}{3}$
$1 : \frac{1}{3}$
$3 : 1$

e.) $6\frac{2}{3} : 3$
$\frac{20}{3} : 3$
$20 : 9$

f.) $2 : 4\frac{4}{5}$
$2 : \frac{24}{5}$
$1 : \frac{12}{5}$
$5 : 12$

g.) $15 : 8\frac{1}{3}$
$15 : \frac{25}{3}$
$3 : \frac{5}{3}$
$9 : 5$

h.) $9\frac{9}{10} : 10$
$\frac{99}{10} : 10$
$99 : 100$

i.) $\frac{1}{2} : \frac{3}{4}$
$1 : \frac{3}{2}$
$2 : 3$

k.) $\frac{2}{5} : \frac{8}{15}$
$2 : \frac{8}{3}$
$1 : \frac{4}{3}$
$3 : 4$

l.) $2\frac{1}{2} : 3\frac{1}{3}$
$\frac{5}{2} : \frac{10}{3}$
$\frac{1}{2} : \frac{2}{3}$
$\frac{3}{2} : 2$
$3 : 4$

m.) $2\frac{2}{5} : 1\frac{1}{4}$
$\frac{8}{3} : \frac{5}{4}$
$\frac{32}{3} : 5$
$32 : 15$

n.) $18\frac{1}{4} : 25\frac{3}{7}$
$\frac{73}{4} : \frac{178}{7}$
$\frac{571}{4} : 178$
$571 : 712$

o.) $75\frac{8}{9} : 46\frac{4}{5}$
$\frac{683}{9} : \frac{234}{5}$
$3415 : 2106$

p.) $0{\cdot}4 : 0{\cdot}5$
$4 : 5$

r.) $48 : 9{\cdot}6$
$48 : 96$
$1 : 2$

s.) $5{\cdot}05 : 25{\cdot}25$
$505 : 2525$
$1 : 5$

t.) $0{\cdot}04 : 0{\cdot}4$
$4 : 40$
$1 : 10$

u.) $1{\cdot}44 : 0{\cdot}24$
$144 : 24$
$6 : 1$

v.) $0{\cdot}0006 : 0{\cdot}00018$
$60 : 18$
$10 : 3$

3.) a.) $96 : 136$
$12 : 17$
$1 : \frac{17}{12}$

b.) $135 : 243$
$5 : 9$
$1 : \frac{9}{5}$

c.) $\frac{3}{5} : \frac{4}{5}$
$3 : 4$
$1 : \frac{4}{3}$

d.) $7\frac{1}{2} : 8\frac{1}{2}$
$\frac{15}{2} : \frac{17}{2}$
$1 : \frac{17}{15}$

e.) $4\frac{2}{3} : 5$
$\frac{14}{3} : 5$
$14 : 15$
$1 : \frac{15}{14}$

f.) $6 : 7\frac{1}{2}$
$6 : \frac{15}{2}$
$2 : \frac{5}{2}$
$1 : \frac{5}{4}$

g.) $\frac{5}{12} : \frac{1}{2}$
$\frac{5}{6} : 1$
$5 : 6$
$1 : \frac{6}{5}$

h.) $18\frac{1}{4} : 25\frac{3}{7}$
$\frac{73}{4} : \frac{178}{7}$
$\frac{571}{4} : 178$
$571 : 712$
$1 : \frac{712}{571}$

i.) $1{\cdot}56 : 0{\cdot}26$
$156 : 26$
$6 : 1$
$1 : \frac{1}{6}$

k.) $3{\cdot}42 : 4{\cdot}5$
$342 : 450$
$171 : 225$
$19 : 25$
$1 : \frac{25}{19}$

Zadaci.

1.) $24 : 48$
$1 : 2$

b.) $500 : 345$
$100 : 69$

c.) $2\frac{5}{12} : 3\frac{4}{12}$
$\frac{29}{12} : \frac{40}{12}$
$29 : 40$

d.) $100 : 85$
$20 : 17$

e.) $8a : 100a$
$2 : 25$

f.) $15g : 0{\cdot}8kg$
$15g : 8kg$
$15g : 8000g$
$3 : 1600$

g.) $105\,m^2 : 205\,m^2$
$21 : 41$

2.) a.) $84 : 126$
$42 : 63$
$2 : 3$

b.) $126 : 84$
$3 : 2$

3.) $60 : 33\frac{1}{3}$

$60 : \frac{100}{3}$

$3 : \frac{5}{3}$

$9 : 5$

4.) $43\frac{3}{4} : 3\frac{3}{5}$

$\frac{175}{4} : \frac{18}{5}$

$875 : 72$.

5.) $12 : 1$

6.) $3{\cdot}75 : 4{\cdot}77$

$375 : 477$

$125 : 159$

7.) 1 kg prve robe stoji $\frac{3 \cdot 75}{3} = 1{\cdot}25$ K

1 " druge " " $\frac{7 \cdot 5}{5} = 1{\cdot}50$ K

$1{\cdot}25 : 1{\cdot}50$

$125 : 150$

$5 : 6$

8.) $3{\cdot}80 : 0{\cdot}95$

$380 : 95$

$76 : 19$

$4 : 1$

9.) Izraggjen u knjizi.

10.) $9 : 12$

$3 : 4$

11.) a.) $34 : 51$ jer je brzina točka sa više zubaca manja, nego o brzina točka sa manje zubaca. Brzina prvog točka odnosi se prema brzini drugog točka kao $\frac{1}{51} : \frac{1}{34}$ ili $34 : 51$

b.) $42 : 35$ ili $6 : 5$. Vidi a.)

12.) $4\frac{2}{3} : 6\frac{1}{3} = \frac{14}{3} : \frac{19}{3} = 14 : 19$

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§ 35. Razmjeri

1.) $18 : 2 = 63 : 7$

$2 \cdot 63 = 18 \cdot 7$

$126 = 126$

2.) $5 : 8 = 15 : 24$

$5 \cdot 24 = 8 \cdot 15$

$120 = 120$

3.) $4 : 3 = 9 : 7$

$28 \neq 27$

4.) $8 : 13 = 5 : 8$

$64 \neq 65$

5.) $0{\cdot}3 : 0{\cdot}7 = \frac{3}{4} : 1\frac{3}{4}$

$0{\cdot}7 \cdot \frac{3}{4} = 0{\cdot}3 \cdot 1\frac{3}{4}$

$\frac{21}{40} = \frac{21}{40}$

6.) $7 : 8 = 2\frac{5}{8} : 3$

$7 : 8 = \frac{21}{8} : 3$

$21 = 21$

7.) $8\frac{1}{4} : 10 = 4 : 4\frac{8}{33}$

$\frac{33}{4} : 10 = 4 : \frac{160}{33}$

$40 = 40$

8.) $3\frac{3}{4} : 10 = 7\frac{2}{3} : 24$

$\frac{15}{4} : 10 = \frac{23}{3} : 24$

$90 \neq \frac{230}{3}$

3.) $7\frac{3}{4} : 31 = 8 : x$

$\frac{31}{4} : 31 = 8 : x$

$\frac{1}{4} : 1 = 8 : x$

$1 : 4 = 8 : x$

$x = 32$

4.) $x : \frac{5}{8} = \frac{1}{3} : 2\frac{3}{4}$

$x : \frac{5}{8} = \frac{1}{3} : \frac{11}{4}$

$x : \frac{5}{2} = \frac{1}{3} : 11$

$x : 5 = \frac{1}{3} : 22$

$x : 5 = 1 : 66$

$x = \frac{5}{66}$

5.) $4\frac{1}{2} : x = 6 : \frac{2}{5}$

$\frac{9}{2} : x = 6 : \frac{2}{5}$

$\frac{3}{2} : x = 2 : \frac{2}{5}$

$\frac{3}{2} : x = 1 : \frac{1}{5}$

$\frac{3}{2} : x = 5 : 1$

$3 : x = 10 : 1$

$x = \frac{3}{10}$

6.) $8\frac{7}{9} : 5\frac{1}{6} = x : 4\frac{2}{3}$

$\frac{79}{9} : \frac{31}{6} = x : \frac{14}{3}$

$\frac{79}{9} : 31 = x : 28$

$79 : 279 = x : 28$

$x = \frac{28 \cdot 79}{279} = \frac{2212}{279}$

7.) $0{\cdot}4 : x = 6\frac{5}{12} : 13\frac{1}{2}$

$\frac{4}{9} : x = \frac{77}{12} : \frac{27}{2}$

$\frac{4}{9} : x = \frac{154}{12} : 27$

$\frac{2}{3} : x = \frac{77}{4} : 27$

$8 : x = 231 : 27$

$8 : x = 77 : 9$

$x = \frac{72}{77}$

8.) $7\frac{2}{3} : 0{\cdot}6 = 0{\cdot}6 : x$

$\frac{23}{3} : 0{\cdot}6 = 0{\cdot}6 : x$

$23 : 1{\cdot}8 = 0{\cdot}6 : x$

$x = \frac{1{\cdot}08}{23} = \frac{108}{2300}$

$x = \frac{27}{575}$

1.) $72 : 31 = 144 : x$

$1 : 31 = 2 : x$

2.) $x : 7\frac{1}{2} = 15\frac{1}{8} : 9\frac{1}{5}$

$x : \frac{15}{2} = \frac{121}{8} : \frac{46}{5}$

$x : \frac{75}{2} = \frac{121}{8} : 46$

$x : 75 = 121 : 736$

3.) $6 : 3\frac{3}{4} = x : 9\frac{1}{2}$

$6 : \frac{15}{4} = x : \frac{19}{2}$

$4 : 5 = x : 19$

4.) $\frac{1}{4} : \frac{2}{3} = \frac{5}{8} : x$

$3 : 8 = \frac{5}{8} : x$

$3 : 1 = 5 : x$

5.) $2\frac{3}{8} : x = 8\frac{4}{9} : 13\frac{5}{18}$

$\frac{19}{8} : x = \frac{76}{9} : \frac{239}{18}$

$\frac{19}{8} : x = 76 : \frac{239}{2}$

$\frac{1}{8} : x = 4 : \frac{239}{2}$

$1 : x = 64 : 239.$

6.) $x : 18\frac{5}{12} = 9\frac{4}{5} : 97\frac{13}{60}$

$x : \frac{221}{12} = \frac{49}{5} : \frac{5833}{60}$

$x : 221 = \frac{49}{5} : \frac{5833}{5}$

$x : 221 = 49 : 5833$

7.) $5\frac{1}{5} : 6\frac{2}{9} = 18 : x$

$\frac{26}{5} : \frac{56}{9} = 18 : x$

$13 : \frac{56}{9} = 45 : x$

$13 : 5\frac{6}{9} = 5 : x$

8.) $1\frac{5}{9} : x = 3\frac{13}{25} : 4\frac{4}{5}$

$\frac{14}{9} : x = \frac{88}{25} : \frac{24}{5}$

$\frac{14}{9} : x = 11 : 15$

$14 : x = 99 : 15$

$14 : x = 33 : 5$

9.) $x : 0{\cdot}7 = 3{\cdot}35 : 2{\cdot}5$

$x : 7 = 3{\cdot}35 : 25$

$x : 7 = 0{\cdot}67 : 5$

$x : 7 = 67 : 500$

10.) $8{\cdot}2\dot{7} : 3{\cdot}7083\dot{3} = x : 20\frac{5}{8}$

$8\frac{27-2}{90} : 3\frac{7083-70}{9000} = x : \frac{165}{8}$

$8\frac{25}{90} : 3\frac{6375}{9000} = x : \frac{165}{8}$

$\frac{745}{90} : \frac{33375}{9000} = x : \frac{165}{8}$

$745 : \frac{33375}{100} = x : \frac{165}{8}$

$74500 : 6675 = x : \frac{33}{8}$

$74500 : 2225 = x : \frac{11}{8}$

$2980 : 89 = x : \frac{11}{8}$

$745 : 178 = x : 11$

11.) $24 : 72 = 13 : x$

$1 : 3 = 13 : x$

$x = 39$

12.) $7 : x = 63 : 16$

$1 : x = 9 : 16$

$x = \frac{16}{9}$

13.) $55 : x = 12\frac{1}{4} : 40$

$55 : x = \frac{49}{4} : 40$

$55 : x = 49 : 160$

$x = \frac{160 \cdot 55}{49} = \frac{8800}{49}$

14.) $6\frac{2}{3} : 4\frac{1}{3} = 20 : x$

$\frac{20}{3} : \frac{13}{3} = 20 : x$

$1 : 13 = 1 : x$

$x = 13$

15.) $3\frac{1}{4} : 3\frac{1}{2} = 10\frac{4}{5} : x$

$\frac{13}{4} : \frac{7}{2} = \frac{54}{5} : x$

$13 : 14 = \frac{54}{5} : x$

$x = \frac{54 \cdot 14}{65} = \frac{756}{65}$

16.) $5 : 5\frac{1}{3} = 2\frac{1}{2} : x$

$5 : \frac{16}{3} = \frac{5}{2} : x$

$1 : \frac{16}{3} = \frac{1}{2} : x$

$3 : 8 = 1 : x$

$x = \frac{8}{3}$

17.) $2\frac{1}{2} : x = 4\frac{5}{6} : 8\frac{2}{3}$

$\frac{5}{2} : x = \frac{29}{6} : \frac{26}{3}$

$5 : x = \frac{29}{3} : \frac{26}{3}$

$5 : x = 29 : 26$

$x = \frac{130}{29}$

18.) $x : 12\frac{1}{2} = 19\frac{1}{6} : 17\frac{1}{2}$

$x : \frac{25}{2} = \frac{115}{6} : \frac{35}{2}$

$x : 5 = \frac{115}{6} : 7$

$x : 5 = 115 : 42$

$x = \frac{575}{42}$

19.) $0{\cdot}25 : 0{\cdot}75 = 1{\cdot}4 : x$

$25 : 75 = 1{\cdot}4 : x$

$1 : 3 = 1{\cdot}4 : x$

$10 : 3 = 14 : x$

$5 : 3 = 7 : x$

$x = \frac{21}{5}$

20.) $15{\cdot}24 : x = 4 : 12{\cdot}4$

$3{\cdot}81 : x = 1 : 12{\cdot}4$

$x = 3{\cdot}81 \cdot 12{\cdot}4 = 47{\cdot}244$

§ 36. Prosto pravilo trojno.

1.) 24 ↗ 4 ↓

x ↗ 2 ↓

$x : 24 = 4 : 2$

$x = 48$ podnika

2.) 12 ↗ 10 ↑

x ↗ 24 ↑

$x : 12 = 24 : 10$

$x = 28{\cdot}8$ K

3.a.) 16 ↑ 0·50 ↓

x ↗ 1 ↓

$x : 16 = 0{\cdot}5 : 1$

$x = 8$ m

b.) 16 ↑ 0·50 ↓

x ↑ 0·75 ↓

$x : 16 = 0{\cdot}50 : 0{\cdot}75$

$x = 10\frac{2}{3}$ m

4.) Ostatek je $135 - 75 = 60$ kg

135 ↗ 246·75 ↑

60 ↗ x

$x : 246{\cdot}75 = 60 : 135$

$x = \frac{329}{3} = 109\frac{2}{3}$ K

5.) Za 37·52 K moći će se kupiti: 100-72=28 kg robe

28 : 37·52 ↑
42·5 ↑ : x ↑

x = 1·34. 42·5 = 56·95 K

x : 37·52 = 42·5 : 28

6.) 12 mjeseci 150 K
5 " ↑ x ↑ x = 62·5 K

x : 150 = 5 : 12

7.) 1 sat 8 hl
x " ↑ 60 hl ↑ x = 7·5 sati

x : 1 = 60 : 8

8.) 18 kosaca 4 dana
12 " ↓ x " ↑

x : 4 = 18 : 12
x = 6 dana

9.) 12 sati dnevno 15 dana
10 " " ↓ x " ↑

x : 15 = 12 : 10
x = 18 dana

10.) 12 mjeseci 1080 K
8 " ↑ x K ↑

x : 1080 = 8 : 12
x = 720

11.) a.) 100 K 4·50 K
1258 K ↑ x ↑

x : 4·5 = 1258 : 100
x = 56·61

11.) b.) Za dvije godine treba da plati B A-u na svakih 100 K 2 puta više, nego za 1 g, tj. 9 K

100 ↑ 9 ↑
1258 ↑ x ↑

x : 9 = 1258 : 100
x = 113·22 K

12.) 6 dana po 35
8 " ↓ " x ↑

x : 35 = 6 : 8
x = 26·250 km

13.) 18 min 396 l
30 " ↑ x ↑

x : 396 = 30 : 18
x = 660 l

14.) 7 sati dnevno 48 dana
12 " " ↓ x " ↑

x : 48 = 7 : 12
x = 28 dana

15.) a.) 50 redova 24 tabka
40 " ↓ x " ↑

x : 24 = 50 : 40
x = 30 tabaka

b.) 50 redova 24 tabka
x " ↑ 25 " ↓

x : 50 = 24 : 25
x = 48 redova

16.) a.) 12 mjeseci 336 K
7 " ↑ x ↑

x : 336 = 7 : 12
x = 196

b.) 12 mjeseci 336 K
x " ↑ 126 K ↑

x : 12 = 126 : 336
x = 4·5 mjeseci

17.) Po upute u knjizi.

18.) 32 radnika radili bi još 18 dana
24 ↓ " radića " x " ↑

x : 18 = 32 : 24
x = 24 dana. Posao će ukupno trajati 6 + 24 = 30 dana.

19.) 10 radnika radili bi još 14 dana
4 ↓ " radić " x " ↑

x : 14 = 10 : 4 x = 35 dana

Posao će biti gotov za 4 + 35 = 39 dana.

20.) 30 ljudi popši pio posao za 12 nedelj'a
30 " " za 6 nedelj'a ½ posla
45 " ↑ " " 6 " x " ↑

x : ½ = 45 : 30
x = ¾ posla. 45 radnika ologo-tovilo je dakle za 6 nedelj'a ¾ posla. Ostaje ¼ posla neodvršena. Ako 45 radnika sopši ¾ posla za 6 nedelj'a, sopšće ¼ za 2 nedelj'e.

45 radnika za 2 nedelj'e sopši i ostatak
x ↑ " " 3 ↓ " " "

$x : 45 = 2 : 3 \qquad x = 30$ radnika

22.) Da se nije dužina otvora promijenila, trebao bi da nabavi još $1500\,m^3$ po 80 cm dužine.

1500	80
x	64

$x : 1500 = 80 : 64 \qquad x = 1875$

23.) Za 200 ovaca bilo bi još za 3 mjes. hrane
" 360 " bića " " x " "

$x : 3 = 200 : 360 \qquad x = 1\frac{2}{3}$ mjeseca

24.) 10 ljudi sprži za 15 dana cio posao
10 " " " 5 " $\frac{1}{3}$ posla
6 " " " 5 " x "

$x : \frac{1}{3} = 6 : 10$

$x = \frac{1}{5}$ posla obavi 6 radnika za 5 dana
6 radnika za 5 dana obavi $\frac{1}{5}$ posla
1 " " 1 " " $\frac{1}{5 \cdot 5 \cdot 6} = \frac{1}{150}$ posla
8 " " 3 " " $\frac{24}{150} = \frac{4}{25}$ posla

Karol napokon ulogju zadnja 4 čovjeka svršeno je $\frac{1}{5} + \frac{4}{25} = \frac{9}{25}$ posla. Pita se, kada će 12 radnika svršiti $\frac{16}{25}$ posla, ako 10 ljudi svrši za 15 dana cio posao.

10 ljudi svrši za 15 dana 1 posao t.j. cio posao
10 " " " x " $\frac{16}{25}$

$x : 15 = \frac{16}{25} : 1 \qquad x = \frac{48}{5}$ dana

10 ljudi svrši $\frac{16}{25}$ posla za $\frac{48}{5}$ dana
12 " " $\frac{16}{25}$ " " x "

$x : \frac{48}{5} = 10 : 12 \qquad x = 8$ dana

Posao će dakle biti gotov u $5 + 3 + 8 = 16$ dana.

25.) Konj prevali u isto vrijeme $\frac{5}{12}$ puta što ga lokomotiva prevali, t.j. konj treba za isti put $\frac{12}{5}$ puta više vremena nego lokomotiva, a lokomotiva treba $\frac{5}{12}$ onog vremena što ga treba konj za isti put. Ako konj treba 8 h treba lokomotiva $8 \cdot \frac{5}{12} = 3\frac{1}{3}$ sata.

26.) Po uputi u knjizi.

27.) Na 1000 dijelova težine fosfite dolazi 900 dijelova težine čista srebra
Na x dijelova težine for. dolazi $\frac{1}{9}$ kg.

$x : 1000 = \frac{1}{90} : 900$

$x = \frac{1}{81}$ kg $= 12{,}3456$ g = težina jedne fosfite

28.) Za drugu polovicu trebalo bi 12 radn. 20 dana
" " " " " 15 " x "

$x : 20 = 12 : 15$

$x = 16$ dana

29.) 15 l vode otadne 16 dm^3 leda
720 l " " x " "

$x : 16 = 720 : 15 \qquad x = 768\ dm^3$ leda

30.) – 37.) po uputi za zad. 30. Rezultati u knjizi.

38.) Sa $8\frac{3}{4}$ pomnožen otvor 140
" x " " 32

$x : 8\frac{3}{4} = 32 : 140$

$x : \frac{1}{4} = 32 : 4$

$x = 2$

39.) $6\frac{3}{8}$ pomnožen sa $7\frac{5}{9}$ daje jedan produkt
$\downarrow 5\frac{1}{2}$ " " x $\uparrow$ " isti "

$x : 7\frac{5}{9} = 6\frac{3}{8} : 5\frac{1}{2}$ $x = 8\frac{25}{33}$

40.) 130 zubaca 198 okretaja
$\uparrow x$ " $\downarrow 78$ "

$x : 130 = 198 : 78$
$x = 330$ zubaca

Neupravno, jer se točak okreće polaganije, ako ima više zubaca

41.) 6000 ljudi može živjeti 16 nedelja
$\uparrow x$ " " " $\downarrow 20$ "

$x : 6000 = 16 : 20$ $x = 4800$ ljudi
Ostali 1200 ljudi mora ostaviti tvrđavu.

42. i 43. po uputi u knjizi.

44.) u 3 dijela 5·60 K
$\uparrow$ u 5 " x $\uparrow$

$x : 5{\cdot}60 = 5 : 3$ $x = 9\frac{1}{3}$ K

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§37. Procentni račun.

1.) a.) 2% od 400 = 8
b.) 3% " 500 = 15
c.) 4% " 620 = 4·62 = 24·8
d.) $3\frac{1}{2}$% " 825 = 3·5·8·25 = 28·875
e.) $5\frac{3}{4}$% " 2345 = 5·75 . 23·45 = 134·8375
f.) 7% " 5038 = 7·50·38 = 352·66
g.) 6% " 730 = 6·7·3 = 43·8
h.) $4\frac{3}{5}$‰ od 975 = 4·6 . 0·975 = 4·485

2.) a.) 50% b.) 25% c.) 20% d.) 75%
e.) 875‰ = 87·5%

3.) a.) 3% od 200 = 6; broj je 206
3% " 360 = 10·8; " " 370·8
3% " 500 = 15; " " 515
3% " 1800 = 54; " " 1854
b.) 4% od 300 = 12; broj je 288
4% " 750 = 30; " " 720
4% " 820 = 32·8; " " 787·2
4% " 900 = 36; " " 864

4.) 4% = $\frac{1}{25}$; 5% = $\frac{1}{20}$; 10% = $\frac{1}{10}$, 20% = $\frac{1}{5}$
25% = $\frac{1}{4}$; 50% = $\frac{1}{2}$

4a.) a.) 328 - 5% od 328 = 328 - 5·3·28 = 328 - 16·4 = 311·6 kg
b.) Tara iznosi 5% od 328 = 5·3·28 = 16·4

5.) a.) Dobitak = 8% od 485 K = 8·4·85 = 38·80 K
b.) po uputi u knjizi.

6.) a.) Pripravnina = $2\frac{1}{2}$% od 3258 K = 2·5·32·58 = 81·45 K. b.) Ostaje mu čisto 3258 - pripravnina = 3258 - 81·45 = 3176·55 K

7.) a.) Povišica = 15% od 28 = 15·0·28 = 4·20 K
b.) Povišena nedeljna zaslužba = 28 + 4·20 = 32·20 K

8.) Roba stoji u svemu 2486·60 + 5% od 2486·60 = 2486·60 + 5·24·866 = 2610·93 K

9.) Platiće 518 - $7\frac{1}{2}$% od 518 = 518 - 7·5·5·18 = 479·15

10.) a.) Dobio je u svemu 1656·80 + 20% od 1656·80 = 1656·80 + 20·16·568 = 1988·16
b.) Prodavao je 1 kg po $\frac{1988{\cdot}16}{872} = 2{\cdot}28$ K

11.) Muške djece bilo je 52% od 825 = 52·8·25 = 429. Ženske djece bilo je 825 - 429 = 396.

12.) 100 → 125
18360 → x
x = 125 · 183·6 = 22950
x : 125 = 18360 : 100

13.) Platiti će u svemu 6913·56 + 2¼% od 6913·56 =
= 6913·56 + 2·25 . 69·1356 = 7069·12 K

14.) Račun iznosi: 8563 + 218 + 2% od 8563 =
= 8781 + 2 . 85·63 = 8952·26

15.) a.) 0·5 . 6·18 = 3·09 ; b.) 0·5 . 3·2746 = 1·6373
c.) 0·5 . 57·3686 = 28·6843

16.) 4‰ = 0·4%
a.) 0·4 . 7·2 = 2·88 ; b.) 0·4 . 38457·5 = 15·383

17.) 36·7% od 1031 = 36·7 . 10·31 = 378·377 kg soli

18.) Roba će stajati: 6952·84 + 178·72 + 1·75% od
6952·84 = 7253·23 K

19.) čijena robe ..... 3793·47 K
0·5% senzarije ..... 18·97 K
1·25% provizije ..... 47·42 K
Svota, koju će trgovac platiti 3859·86 K

20.) čijena robe ..... 369·20 K
vožarina ..... 17·34 K
drugi troškovi 5% od 369·20 ..... 18·46 K
Sveukupni troškovi ..... 405·00 K
Dobitak: 34% od 405·00 K ..... 137·70 K
Trgovac mora ola proola robu za .. 542·70 K
1 kg mora ola prodaje za: 542·70 / 100 = 5·43 K

21.) Rabat iznosi: 2·5 . 54·3678 = 135·92 K

22.) Netto težina ulja iznosi 90% od 2583 =
= 2324·700 kg.

Nastavak na drugoj str.

Za 100 kg plati: 136 K sa ½% rabata = 99½% od 136 K = 135·32 K
Za 2324·7 kg " → x
x : 135·32 = 2324·7 : 100 x = 852·40 K
x = 3145·78 K

23.) Na svakih 100 K ima 33⅓% popusta 1 j. plati 66⅔ K
100 → 66⅔
1278·60 → x
x = 852·40 K
x : 66⅔ = 1278·60 : 100

24.) 4¼% od 8540 = 4·25 . 85·40 = 362·95 K

25.) 1⅓% " 30560 = 4/3 . 305·60 = 407·47 K

26.) 1¼% " 85000 = 1·25 . 850 = 1062·50 K

27.) 100 → 106 K
11·29 → x
x = 11·97 K = vrijednost dukata.
x : 106 = 11·29 : 100

28.) Morati će se platiti za 23½% od 206·75 K više u srebrenom novcu.
100 → 123·5
206·75 → x
x = 255·34 K u srebru
x : 123·5 = 206·75 : 100

29.) 21% od 850 = 21 . 8·5 = 178·5 m³ kisika.

30.) Izvršen u knjizi.

31.) a.) 300 → 24
100 → x
x : 24 = 100 : 300
x = 8

b.) 4000 → 120
100 → x
x : 120 = 100 : 4000
x = 3

c.) 4500 → 135
100 → x
x : 135 = 100 : 4500
x = 3

d.) 612 → 30⅗
100 → x
x : 30⅗ = 100 : 612
x = 5

e.) 3·35 ↑ 0·207 ↑
100 ↑ x ↑ x = 6
x 0·207 = 100 : 3·35

32.) 352 ↑ 264 ↑
100 ↑ x ↑
x : 264 = 100 : 352
x = 75

33.) Ima dobitka 898·16 - 824 = 74·16
824 ↑ 74·16 ↑
100 ↑ x ↑
x : 74·16 = 100 : 824
x = 9

34.) Jubitka ima
723 - 676·85 = 46·15
723 ↑ 46·15 ↑
100 ↑ x ↑
x : 46·15 = 100 : 723
x = 6·383 %

35.) Dobitak iznosi
60 - 48 = 12 K
48 ↑ 12 ↑
100 ↑ x ↑
x : 12 = 100 : 48
x = 25 %

36.) Šara iznosi 815 - 749·8 = 65·2 kg
815 ↑ 65·2 ↑
100 ↑ x ↑
x : 65·2 = 100 : 815
x = 8 %

37.) 3600 ↑ 864 ↑
100 ↑ x ↑
x : 864 = 100 : 3600
x = 24 %

38.) Rabat iznosi 9639 - 9253·44 = 385·56 K
9639 ↑ 385·56 ↑
100 ↑ x ↑
x : 385·56 = 100 : 9639
x = 4 %

39.) 10 %

40.) Platio je za robu 5·27. 87·24 = 459·75 K
Troškovi iznose ... 25·14 K
Trgovca stoji roba ... 484·89 K
Trgovac dobije za svu robu 527·1·17 = 616·59 K
Dobio je dakle na cijeloj robi 616·59 - 484·89 =
= 131·70 K. /: Nastavak na drugoj str. :/

484·89 ↑ 131·70 ↑
100 ↑ x ↑ x = 27·16 %
x : 131·70 = 100 : 484·89

41.) Prirast je 45600 - 33884 = 11716
33884 ↑ 11716 ↑
100 ↑ x ↑ x = 34·57 %
x : 11716 = 100 : 33844

42.) 936 ↑ 22·74 ↑
100 ↑ x ↑ x = 2·429 %
x : 22·74 = 100 : 936

43.) Za 1475 K zlata plaća se 1829 K srebra
100 K ↑ " " x " ↑ "
x : 1829 = 100 : 1475 x = 124
Azija = 124 - 100 = 24 %

44.) 100 ↑ 8 ↑
x ↑ 32 ↑
x : 100 = 32·8
x = 400

45.)a) 100 ↑ 5 ↑
x ↑ 617·5 ↑
x : 100 = 617·5 : 5
x = 12350

45.)b.) 100 ↑ 8·5 ↑
x ↑ 86·7 ↑
x : 100 = 86·7 : 8·5
x = 1020

c.) 100 ↑ 7·75 ↑
x ↑ 620 ↑
x : 100 = 620 : 7·75
x = 8000

46.) 100 ↑ 5 ↑
x ↑ 1096 ↑
x : 100 = 1096 : 5
x = 21920

47.) 100 ↑ 8 ↑
x ↑ 400 ↑
x : 100 = 400 : 8
x = 5000

48.) 100 ↑ 2 ↑
x ↑ 104 ↑ x = 5200
x : 100 = 104 : 2

49.) 100 ↑ 5
x ↑ 4720 ↑
x : 100 = 4720 : 5
x = 94400 kg

50.) 100 ↑ 24
x ↑ 528 ↑
x : 100 = 528 : 24
x = 2200

51.) a.) 100 ↑ 104
x ↑ 2236 ↑
x : 100 = 2236 : 104
x = 2150

b.) 100 ↑ 106
x ↑ 588·3 ↑
x : 100 = 588·3 : 106
x = 555

c.) 100 ↑ 102·5
x ↑ 353·625 ↑
x : 100 = 353·625 : 102·5
x = 345

d.) 100 ↑ 105·5
x ↑ 1301·87 ↑
x : 100 = 1301·87 : 105·5
x = 1234

52., 53. i 54. izvrsjeni u knjizi.

55.) Na 100K platio je 96
" x " " " 208·58 ↑
x : 100 = 208·58 : 96 x = 217·27K

56.) 100 ↑ 112
x ↑ 3500 ↑
x : 100 = 3500 : 112
x = 3125K

57.) 100 ↑ 100·5
x ↑ 2653·40 ↑
x : 100 = 2653·40 : 100·5
x = 2640·20

58.) Treba najprije izračunati, koliko je ljudi prije bilo.
100 ↑ 85
x ↑ 16840 ↑
x : 100 = 16840 : 85
x = 19811
Umrlo ih je dakle
19811 – 16840 = 2971 osoba

59.) Treba najprije izracunati vrijednost robe 100 ↑ 90
x ↑ 150 ↑
x : 100 = 150 : 90
x = 166 2/3 K = vrijed. robe.

100 ↑ 108
166 2/3 ↑ x ↑
Robu treba da proda za 180K da dobije 8%
x : 108 = 166 2/3 : 100
x = 180K

60.) 100 ↑ 112
x ↑ 336 ↑
x : 100 = 336 : 112
x = 300K

61.) Treba izračunati, koliko vrijedi 1hl
100 ↑ 104
x ↑ 60 ↑
x : 100 = 60 : 104
x = 57 9/13
Sto prodaje 1hl za 3 3/4 K jeftinije, to ga prodaje za 60 – 3 3/4 = 56 1/4 K, Gubi dakle i to kod svakog hektolitra 57 9/13 – 56 1/4 = 1 23/52 K

57 9/13 ↑ 1 23/52 ↑
100 ↑ x ↑
x : 1 23/52 = 100 : 57 9/13
x = 2·5%

62.) Treba izračunati kojiko robe vrijedi.
100 ↑ 94
x ↑ 940
x = 1000K vrijedi robe

100 ↑ 104
1000 ↑ x
x = 1040K
Za 1040K valja robu prodati, da se dobije 4%.

63.) Zaslužio je u svemu 50h = 1/5 od 2·5K t.j. 20%

64.) 100 ↑ 108
x ↑ 81 ↑
x : 100 = 81 : 108
x = 75 l vina

65.) Ona 42 zdrava djeteta bila su dakle
100 – 12·5 = 87·5% sve djece

/: Nastavak na drugoj str. :/

100 ↑ 87.5
x ↑ 42 ↑ x = 48 djece

x : 100 = 42 : 87.5

66.) Traba izračunati koliko alkohola ima u 180 l špirita. Ima 85% od 180 = 153 l alkohola. Kad se doda onim 180 l još 20 l vode, biti će 200 l tekućine, u kojoj ima 153 l alkohola.

200 ↑ 153 ↑
100 ↑ x ↑ x = 76.5%

67.) Dobio je 3.250 − 600 = 750 − 600 = 150 K

600 ↑ 150 ↑
100 ↑ x ↑ x = 25%

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§ 38. Kamatni račun.

A. Proračunavanje kamata.

1.) Izračunajen u knjizi.

2.) a.) $83.3\frac{1}{2} = 83.\frac{7}{2} = 290.5\,K$

b.) $83.4\frac{5}{12} = 83.\frac{53}{12} = 366\frac{7}{12}\,K$

c.) $83.7\frac{25}{36} = 83.\frac{277}{36} = 638\frac{5}{36}\,K$

3.) a.) $3\frac{3}{4}$ g 461.25 K
$5\frac{1}{2}$ g ↑ x ↑
x : 461.25 = $5\frac{1}{2} : 3\frac{3}{4}$
x = 676.50 K

b.) $3\frac{3}{4}$ g 461.25 K
$6\frac{1}{3}$ g ↑ x ↑
x : 461.25 = $6\frac{1}{3} : 3\frac{3}{4}$
x = 779.00 K

4.) a.) 7.5% 64 K
1% ↑ x ↑
x : 64 = 1 : 7.5
x = 8.53 K

b.) 7.5% 64 K ↑
3% ↑ x
x : 64 = 3 : 7.5
x = 25.6

4.) c.) 7.5% 64 ↑
8.25% ↑ x ↑ x = 70.4 K
x : 64 = 8.25 : 7.5

5.) 3600 K donese za 1 g $\frac{540}{3}$ = 180 K kamata
5800 K ↑ " " " x ↑ "
x : 180 = 5800 : 3600 x = 290 K

Za 5 g i 7 mjeseci donese 5800 K $5\frac{7}{12}.290 = 1619\frac{1}{6}$ K kamata.

6.) Izračunajen u knjizi.

7.) a.) Kamate = $\frac{2364.80.4.75.3}{100} = 336.98$ K

b.) " = $\frac{5427.58.5.5.2\frac{1}{3}}{100} = 696.54$ K

c.) " = $\frac{13467.6.25.3}{100} = 2525.06$ K

8.) Kamate = $\frac{5238.5.2.75}{100} = 720.23$ K

" = $\frac{4855.35.4.75.3\frac{5}{12}}{100} = 787.98$ K

Druga glavnica nosi za 787.98 − 720.23 = 67.75 K više kamata.

9.) Posjednik će platiti: $17000 + \frac{17000.5.5.3}{100} = 19805$ K.

10.) Kamate = $\frac{6285.4.\frac{8}{12}}{100} = 167.60$ K

11.) " = $\frac{3856.0.75.8}{100} = 231.36$ K

12.) Kamate = $\frac{840.30.6.2.75}{100} = 138.65$ K

$\frac{1}{2}$% mjesečno = $\frac{12}{2}$% = 6% godišnje

13.) Kamate = $\frac{750.4.\frac{5}{12}}{100} = 12.50$ K

" = $\frac{860.5.0.5}{100} = 21.50$ K

Kamate = $\frac{950 \cdot 4{\cdot}75 \cdot \frac{7}{12}}{100} = 26{\cdot}31\,K$

" = $\frac{780 \cdot 5 \cdot 5 \cdot 0{\cdot}75}{100} = 32{\cdot}18\,K$

Ukupne kamate = 92·49 K

14.) a.) Kamate = $\frac{3750 \cdot 4{\cdot}75 \cdot \frac{35}{365}}{100} = 17{\cdot}08$

b.) " = $\frac{11680 \cdot 4 \cdot 5 \cdot \frac{65}{365}}{100} = 93{\cdot}60$

15.) a.) Kamate = $\frac{3552 \cdot 5 \cdot \frac{69}{365}}{100} = 33{\cdot}58$

b.) " = $\frac{8473 \cdot 5 \cdot 5 \cdot \frac{40}{365}}{100} = 51{\cdot}07$

c.) " = $\frac{9500 \cdot 6 \cdot \frac{75}{365}}{100} = 117{\cdot}12$

16.) 100 ↑ 106
x ↑ 795 ↑ x = 750 K

x : 100 = 795 : 106

17.) 100 K uz 4% do nos. za $\frac{1}{2}$ g 102 K ... 102
x ↑ " " 4590 ↑

x : 100 = 4590 : 102 x = 4500

Platio je u inne kamata 4590 - 4500 = 90 K

B. Proračun nova nje glavnice.

1.) Izračunjen u knjizi.

2.) a.) 100 ↑ 6·75 ↑
x ↑ 324 ↑

x : 100 = 324 : 6·75

x = 4800

b.) 100 ↑ 6·75 ↑
x ↑ 10·80 ↑

x : 100 = 10·80 : 6·75

x = 160

c.) 100 ↑ 6·75 ↑
x ↑ 54 ↑

x : 100 = 54 : 6·75

x = 800

3.) Izračunjen u knjizi.

4.) a.) Glavnica = $\frac{100 \cdot 375 \cdot 30}{3 \cdot 4 \cdot 5} = 2780\,K$

b.) " = $\frac{100 \cdot 617 \cdot 68}{5 \cdot 4\frac{2}{3}} = 2647{\cdot}20\,K$

c.) " = $\frac{100 \cdot 1675}{5 \cdot 4 \cdot 0{\cdot}8} = 34166{\cdot}64\,K$

d.) " = $\frac{100 \cdot 1476}{4 \cdot 3\frac{5}{12}} = 10800{\cdot}00\,K$

e.) " = $\frac{100 \cdot 950}{9 \cdot 0 \cdot 5} = 21111{\cdot}19\,K$

5.) Može se pomnožiti za glavnicu, koja uz 5% nosi godišnje 1875 K

100 ↑ 5
x ↑ 1875 ↑

x : 100 = 1875 : 5

x = 37500

6.) Izračunjen u knjizi.

7.) 100 K naraste uz 4% za 3 g. na 112 K
x K ↑ " " " " " 4200 K ↑

x : 100 = 4200 : 112 x = 3750 K

b.) 100 K naraste uz 4% za $\frac{1}{12}$ g na $100\frac{1}{3}$ K
x K ↑ " " " " " 602 K ↑

x : 100 = 602 : $100\frac{1}{3}$ x = 600 K

c.) 100 K naraste uz 5% za $2\frac{1}{2}$ g na 112·5 K
x K ↑ " " " " " " 53484·30 K ↑

x : 100 = 53484·3 : 112·5 x = 47541·60 K

d.) 100 K naraste uz 4% za $4\frac{1}{2}$ g na 118 K
x K ↑ " " " " " " 1288·56 K ↑

x : 100 = 1288·56 : 118 x = 1092 K

e.) 100 K naraste uz 3·5% za $\frac{3}{4}$ g na 102·625 K
x K ↑ " " " " " " 4433·40 K ↑

x : 100 = 4433·4 : 102·625 x = 4320 K

C. Proračunavanje procenta.

1.) Buduć je glavnica 2 puta tolika, biti će i kamate za isto vrijeme uz iste postotke dvostruke /: Kamate = 48K :/

2.) Po 4%. Vidi primjedbu u knjizi.

3.) Izvrsjen u knjizi.

4.) " " "

5.) a.) Procenti = $\frac{93 \cdot 50 \cdot 100}{680 \cdot 2 \cdot 5} = 5\frac{1}{2}\%$

b.) " = $\frac{475 \cdot 65 \cdot 100}{4530 \cdot 3 \cdot 5} = 3\%$

c.) " = $\frac{25 \cdot 100}{1000 \cdot 5} = \frac{1}{2}\%$

d.) " = $\frac{22 \cdot 23 \cdot 100}{280 \cdot 80 \cdot 9 \cdot 5} = 1{\cdot}2\%$

e.) " = $\frac{90 \cdot 90 \cdot 100}{7272 \cdot \frac{100}{365}} = 4{\cdot}5\%$

6.) Procenti = $\frac{1394 \cdot 100}{24600} = 5\frac{2}{3}\%$

7.) B treba da plaća iza prve godine kamate od 6000 + $4\frac{1}{2}\%$ od 6000 = 6000 + 270 = = 6270K, jer nije platio kamate, nego još uzajmio 1200K.

Kamate dakle iznose $\frac{6270 \cdot 4\frac{1}{2}}{100} = 282{\cdot}15$ K

Cijela uzajmljena svota sa jednogodišnjim kamatama od 6000K uz $4\frac{1}{2}\%$ iznosi:

6270 + 1200 = 7470K

7470 ↑ 282·15
100 ↑ x ↑ x = 3·776%

x : 282·15 = 100 : 7470

8.) Procenti = $\frac{800 \cdot 100}{800 \cdot 41\frac{2}{3}} = \frac{100}{\frac{125}{3}} = 2\frac{2}{5}\%$

9.) Za 7 mjeseci 1324K
" 4 " x ↑

Najprije izračunaj koliko donese glavnica uz nepoznate postotke za 4 mjeseca

x : 1324 = 4 : 7
x = $756\frac{4}{7}$ K

Neka glavnica donese za 4 mj. uz $3\frac{1}{3}\%$ 560K
" " " " 4 " " x% ↑ $756\frac{4}{7}$K ↑

x : $3\frac{1}{3}$ = $756\frac{4}{7}$: 560
x = 4·5%

10.) Glavnica treba da donese za 9 mjeseci $2\frac{1}{2}$ puta više. Za 6 mjeseci donijet će $1\frac{2}{3}$ puta više /: 9 ↑ $2\frac{1}{2}$ puta / 6 ↑ x puta ↑ :/ x = $1\frac{2}{3}$ puta

Ako neka glavnica uz isto vrijeme donese jednom $1\frac{2}{3}$ puta više kamata, to moraju i procenti biti $1\frac{2}{3}$ puta veći. T.j. glavnicu valja uložiti po $3 \cdot 1\frac{2}{3} = 5\%$

11.) Vjerovnik dobije dakle na ruku samo 800 - 10% od 800 = 800 - 80 = 720K. Budući bi pak vjerovnik kamate 80K morao platiti istom na kraju godine, gubi on kamate, što ih tih 80K za godinu dana donesu, te platiti u istinu 80 + 10% od 80 = 88K kamata, i to ne za 800K nego za 720K.

Procenti su po tome $\frac{88 \cdot 100}{720} = 12\frac{2}{9}\%$

12.) Dobitak = 4590 - 4250 = 340K

Procenti = $\frac{340 \cdot 100}{4250} = 8\%$

13.) 2520 K glavnice uz 6% neke kamate
2880 K ↓ " " ↑ x % iste "

x : 6 = 2520 : 2880 $x = 5\frac{1}{4}$ %

D. Proračunavanje vremena.

1.) 1 god. 14 K
x " ↑ 64 K ↑ $x = 4\frac{4}{7}$ godine

x : 1 = 64 : 14

2.) Izvađen u knjizi.

3.) a.) Vrijeme = $\frac{76 \cdot 26 \cdot 100}{635 \cdot 50 \cdot 4} = 3$ god.

b.) " = $\frac{14 \cdot 70 \cdot 100}{560 \cdot 3 \cdot 5} = \frac{3}{4}$ " = 9 mjeseci

c.) " = $\frac{20 \cdot 100}{1440 \cdot 3 \cdot 25} = \frac{50}{117}$ god.

d.) " = $\frac{56 \cdot 25 \cdot 100}{30000 \cdot 4 \cdot 5} = \frac{1}{24}$ g = $\frac{1}{2}$ mjeseca

4.) a.) Vrijeme = $\frac{3 \cdot 78 \cdot 100}{54 \cdot 10} \cdot 360 = 126$ dana

b.) " = $\frac{1 \cdot 44 \cdot 100}{360 \cdot 4} \cdot 360 = 38$ "

c.) " = $\frac{8 \cdot 25 \cdot 100}{297 \cdot 5} \cdot 360 = 200$ "

d.) " = $\frac{7 \cdot 100}{400 \cdot 4 \cdot 5} \cdot 360 = 140$ "

5.) $\frac{800 \cdot 100}{800 \cdot 5} = 20$ godina

6.) a.) $\frac{100}{10} = 10$ g; b.) $\frac{100}{4} = 25$ g; c.) $\frac{100}{3 \cdot 5} = 28\frac{4}{7}$ g

d.) $\frac{100}{2} = 50$ g

7.) Kamate iznose 9137·50 - 9000 = 137·50 K

Vrijeme = $\frac{137 \cdot 50 \cdot 100}{9000 \cdot 5 \cdot 5} \cdot 360 = 100$ dana

Dug je vraćen iza 100 = 3 mj. i 10 dana

8.) a.) Kamate iznose 7633·71 - 7560 = 73·71

Vrijeme = $\frac{73 \cdot 71 \cdot 100}{7560 \cdot 4 \cdot 5} = 78$ dana. Dug je vraćen 1. sept.

8.) b.) Kamate iznose 3828·50 - 3800 = 28·50 K

Vrijeme = $\frac{28 \cdot 50 \cdot 100}{3800 \cdot 5} \cdot 360 = 54$ dana

Dug je vraćen 18. marta.

c.) Kamate iznose 1508 - 1500 = 8 K

Vrijeme = $\frac{8 \cdot 100}{1500 \cdot 4} \cdot 360 = 48$ dana

Dug je vraćen 1. Februara

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§. 39. Diskontni račun.

Zadaci su rađeni po ispravnom a ne po trgovačkom načinu diskontiranja.

1.) Na 112·5 K 12·5 K popusta (za $2\frac{1}{2}$ g)
" 1557 K ↑ x ↑

x : 12·5 = 1557 : 112·5 x = 173

Diskontirana glavnica = 1557 - 173 = 1384 K

2.) 106 K 6 K popusta (za 1 g)
2289·6 K ↑ x ↑ "

x : 6 = 2289·6 : 106 x = 129·6

3.) Na 122·5 K 22·5 K popusta
" 33075 K ↑ x ↑ "

x : 22·5 = 33075 : 122·5 x = 6075

Diskontirana glavnica = 27000 K

4.) Prvi put treba diskontirati za $1\frac{1}{2} - \frac{1}{3} = \frac{7}{6}$ godine i to polovicu dužne svote.

$105\frac{5}{6}$ K $5\frac{5}{6}$ K popusta [za $\frac{7}{6}$ g uz 5%]
38843 K ↑ x ↑ "

x : $5\frac{5}{6}$ = 38843 : $105\frac{5}{6}$ x = 2140·95 K

Prvi put dakle plati: $38843 - 2140{\cdot}95 = 36702{\cdot}05$ K

Drugi put valja diskontirati za $1\frac{1}{2} - \frac{2}{3} = \frac{5}{6}$ god.

105 K 5 K popusta /: za $\frac{5}{6}$ g uz 6 % :/

38843 K ↑ x ↑ "

$x : 5 = 38843 : 105$ $x = 1849\frac{2}{3}$ K

Drugi put dakle plati: $38843 - 1849\frac{2}{3} = 36993\frac{1}{3}$ K

5.) Najbolja je ponuda, koja daje najveću diskontiranu glavnicu.

A. 116·25 K 16·25 K popusta /: za $3\frac{1}{4}$ g uz 5 % :/

7350 K ↑ x ↑ "

$x : 16{\cdot}25 = 7350 : 116{\cdot}25$. $x = 1027{\cdot}42$ K

Diskontirana glavnica = $7350 - 1027{\cdot}42 = 6322{\cdot}58$ K

B. 110 K 10 K popusta /: za 2 g. uz 5 % :/

7150 K ↑ x ↑ "

$x : 10 = 7150 : 110$ $x = 650$ K

Diskontirana glavnica $7150 - 650 = 6500$ K

C. Plaća 6525 K ovnah.

C-ova je dakle ponuda najbolja.

6.) Dug je jednak diskontiranoj glavnici plus kamate kroz 5 god. uz $4\frac{1}{2}$ %

100 122·5 K /: za 5 g uz $4\frac{1}{2}$ % :/

3000 ↑ x ↑

$x : 122{\cdot}5 = 3000 : 100$ $x = 3675$ K

7.) Izvagjen u knjizi.

8.) Po uputi za zad. 7. u knjizi.

525 za $2\frac{1}{2}$ god 600 ↑ $x = 114\frac{2}{7}$

100 ↑ " " " x /: Nastavak na drugoj str. :/

$x : 600 = 100 : 525$

Kamate od 100 K za $2\frac{1}{2}$ god iznose dakle $14\frac{2}{7}$ K. Za 1 god /: procenti :/ su $= 14\frac{2}{7} : 2\frac{1}{2} = \frac{100}{7} : \frac{5}{2} = 5\frac{5}{7}$ %

9.) Platiti valja 1500 - 300 = 1200 K

Treba izračunati vrijeme, za koje 1200 K uz 5 % donese 300 K

Vrijeme $= \frac{300 \cdot 100}{1200 \cdot 5} = 5$ godina.

10.) a.) 101 K 1 K popusta /: uz 4 % za $\frac{1}{4}$ g :/

1080 K ↑ x ↑

$x : 1 = 1080 : 101$ $x = 10{\cdot}69$ K

Diskontirana glavnica = $1080 - 10{\cdot}69 = 1069{\cdot}31$ K

b.) $100\frac{5}{3}$ K $\frac{5}{3}$ K popusta /: za $\frac{1}{3}$ g uz 5 % :/

4500 K ↑ x ↑

$x : \frac{5}{3} = 4500 : 100\frac{5}{3}$ $x = 73{\cdot}77$ K

Diskontirana glavnica = $4500 - 73{\cdot}77 = 4426{\cdot}23$ K

c.) $100\frac{5}{12}$ K $\frac{5}{12}$ K popusta /: uz $3\frac{1}{3}$ % za $1\frac{1}{2}$ mj. $= \frac{1}{8}$ g :/

1305 K ↑ x ↑ "

$x : \frac{5}{12} = 1305 : 100\frac{5}{12}$ $x = 5{\cdot}41$

Diskontirana glavnica = $1305 - 5{\cdot}41 = 1299{\cdot}59$ K

d.) $101\frac{1}{8}$ K $1\frac{1}{8}$ K popusta /: uz 6 % za $2\frac{1}{4}$ mj. $= \frac{3}{10}$ g :/

10125 K ↑ x ↑ "

$x : 1\frac{1}{8} = 10125 : 101\frac{1}{8}$ $x = 112{\cdot}63$ K

Diskontirana glavnica = $10125 - 112{\cdot}63 = 10012{\cdot}37$ K

11.) Ima se diskontirati za 123 dana uz $4\frac{1}{2}$ %

$101\frac{43}{80}$ K $1\frac{43}{80}$ K popusta

972 K ↑ x ↑ "

$x : 1\frac{43}{80} = 972 : 101\frac{43}{80}$

$x = 14{\cdot}72$

Diskontirana glavnica = $972 - 14{\cdot}72 = 957{\cdot}28$ K

12.) Ima se obiskontirati za 44 dana uz 8%

$100\frac{44}{45}$ K $\frac{44}{45}$ K popusta

1350 K ↑ x ↑

$x : \frac{44}{45} = 1350 : 100\frac{44}{45}$ $x = 13{\cdot}07$

Diskontirana glavnica = 1350 - 13·07 = 1336·93 K

13.) Ima se diskontirati za 128 dana uz 8·5%

103 K 3 K popusta

935 K ↑ x ↑ "

$x : 3 = 935 : 103$ $x = 27{\cdot}233$ K

Diskontirana glavnica = 935 - 27·233 = 907·77 K

14.) Ima se obiskontirati za 93 dana uz 6·5%

101·68 K 1·68 K popusta

2875 K ↑ x ↑

$x : 1{\cdot}68 = 2875 : 101{\cdot}68$ $x = 47{\cdot}50$ K

Diskontirana glavnica = 2875 - 47·50 = 2827·50 K

15.) $101\frac{43}{144}$ K $1\frac{43}{144}$ K popusta [za 85 dana uz $5\frac{1}{2}$%]

2540 ↑ x ↑

$x : \frac{187}{144} = 2540 : \frac{14587}{144}$ $x = 32{\cdot}56$ rublja

Diskontirana glavnica = 2540 - 32·56 = 2507·44 Rb.

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§. 40. Diobeno pravilo.

A. Dijeljenje po aritmetičkom omjeru.

1.) Da dobije svaki jednako, morao bi biti 20 K manje t.j. 300 K. Onda bi svaki dobio 150 K. A dobije dakle 170 K a B 150 K.

2.) Djevojčica ima $\frac{96-4}{2} = 46$; dječaka ima 46 + 4 = 50

3.) B dobije 1 dio

A " 1 " - 180 K

C " 1 " + 120 K

Ukupno dobiju 3 dijela - 60 K što mora biti 1200 K dio = $\frac{1200+60}{3} = 420$ K

A dobijo $420 - 180 = 240$ K

B " 420 K

C " $420 + 120 = 540$ K

4.) Budući da B dobije 20 kg više od A, a C 30 kg manje od B a dobije C 10 kg manje od A

A dobije 1 dio

B " 1 "

C " 1 "

Ukupno dobiju 3 dijela 10 kg što mora biti 100 kg. 1 dio = $\frac{100-10}{3} = 30$ kg

A dobije 30 kg

B " $30 + 20 = 50$ kg

C " $30 - 10 = 20$ kg

5.) Brojci da ima 3 jabuke više od krušaka a 9 šljiva više od jabuka, znači šljiva više od krušaka

Krušaka ima 1 dio

Jabuka " 1 " + 3

Šljiva " 1 " + 12

Ukupno ima 3 dijela + 15 što mora biti 81 voćka. 1 dio = $\frac{81-15}{3} = 22$

Krušaka ima 22, jabuka 22 + 3 = 25, šljiva 22 + 12 = 34.

6.) Prvo dijete dobije 1 dio = 58 h
drugo " " 1 " + 1 h = 59 h
treće " " 1 " + 2 h = 60 h
četvrto " " 1 " + 3 h = 61 h
peto " " 1 " + 4 h = 62 h

Ukupno ima dakle 5 dijelova + 10 h, što mora biti 300 h. 1 dio = $\frac{300-10}{5} = 58$ h

7.) B ima dakle $\frac{39}{3} = 13$ g
A " " $13 + 2\frac{1}{2} = 15\frac{1}{2}$ g
C " " $13 - 2\frac{1}{2} = 10\frac{1}{2}$ g

U izradbi u knjizi uzeto je pogrješno 30 mjesto 39 godina.

8.) Prvi je broj 1 dio
Drugi " " 1 " + 53
Treći " " 1 " + 77

Ukupno ima dakle 3 dijela + 130, što mora biti 1000. 1 dio = $\frac{1000-130}{3} = 290$
Prvi je broj 290, drugi 343, a treći 367

B Dijeljenje po geometričkom omjeru.

I. Prosto dioleno pravilo.

1.) A i B su omjerni brojevi
A dobije $\frac{84}{4+3} \cdot 4 = 48$ K
B " $\frac{84}{4+3} \cdot 3 = 36$ K

2.) Jedan dio = $\frac{1248}{4+9} \cdot 4 = 96 \cdot 4 = 384$
Drugi " = $\frac{1248}{4+9} \cdot 9 = 96 \cdot 9 = 864$

3.) Omjerni su brojevi 2 : 1
Majstor dobije $\frac{186}{2+1} \cdot 2 = 62 \cdot 2 = 124$ K
Pomoćnik " $\frac{186}{2+1} \cdot 1 = 62$ K

4.) Omjerni su brojevi 3 : 1 : 1 : 1
Majstor dobije $\frac{43 \cdot 75}{3+1+1+1} \cdot 3 = 7 \cdot 29 \cdot 3 = 21 \cdot 87$ K
Svaki pomoćnik dobije $\frac{43 \cdot 75}{3+1+1+1} \cdot 1 = 7 \cdot 29$

5.) Omjerni su brojevi 4 : 6 : 6 : 1
terpentina ima $\frac{21 \cdot 25}{4+6+6+1} \cdot 4 = 1 \cdot 25 \cdot 4 = 5$ kg
cinobra ima $\frac{21 \cdot 25}{4+6+6+1} \cdot 6 = 1 \cdot 25 \cdot 6 = 7 \cdot 5$ kg
šelaka ima $\frac{21 \cdot 25}{4+6+6+1} \cdot 6 = 1 \cdot 25 \cdot 6 = 7 \cdot 5$ kg
kreda ima $\frac{2 \cdot 25}{4+6+6+1} \cdot 1 = 1 \cdot 25$ kg

6.) Omjerni su brojevi 27 : 21 : 15 ili 9 : 7 : 5
A dobije $\frac{207}{9+7+5} \cdot 9 = 10 \cdot 9 = 90$ K
B " $\frac{207}{9+7+5} \cdot 7 = 10 \cdot 7 = 70$ K
C " $\frac{207}{9+7+5} \cdot 5 = 10 \cdot 5 = 50$ K

7.) Cijena srećke ne mora biti poznata.
Omjerni su brojevi $\frac{1}{2} : \frac{1}{3} : (1 - \frac{1}{2} - \frac{1}{3} = \frac{1}{6})$ ili 3 : 2 : 1
A dobije $\frac{600}{3+2+1} \cdot 3 = 100 \cdot 3 = 300$ K
B " $\frac{600}{3+2+1} \cdot 2 = 100 \cdot 2 = 200$ K
C " $\frac{600}{3+2+1} \cdot 1 = 100$ K

8.) Omjerni su brojevi 100 : 30 ili 10 : 3
A dobije $\frac{208}{10+3} \cdot 10 = 16 \cdot 10 = 160$
B " $\frac{208}{10+3} \cdot 3 = 16 \cdot 3 = 48$

9.) Omjerni su brojevi /: A, B, C :/ 100 : 112 : 90 : 6
50 : 56 : 45. /: Nastavak na drugoj str. :/

A dobije: $\frac{1540 \cdot 20}{50+56+45} \cdot 50 = 10 \cdot 20 \cdot 50 = 510\,K$

B " $\frac{1540 \cdot 20}{50+56+45} \cdot 56 = 10 \cdot 20 \cdot 56 = 571 \cdot 20\,K$

C " $\frac{1540 \cdot 20}{50+56+45} \cdot 45 = 10 \cdot 20 \cdot 45 = 459 \cdot 0\,K$

10.) Omjerni su brojevi 12800 : 4300 : 3800
ili 128 : 43 : 38

A dobije $\frac{2944}{128+43+38} \cdot 128 = 14 \cdot 09 \cdot 128 = 1803 \cdot 52$

B " $\frac{2944}{128+43+38} \cdot 43 = 14 \cdot 09 \cdot 43 = 605 \cdot 87$

C " $\frac{2944}{128+43+38} \cdot 38 = 14 \cdot 09 \cdot 38 = 535 \cdot 42$

Na 12800 K dobije A 1803·52 K
" 100 K ↑ " x ↑

$x : 1803 \cdot 52 = 100 : 12800 \quad x = 14 \cdot 09\,\%$

11.) Omjerni su brojevi 2460·65 : 3708·70 :
: 2917 ili 492·13 : 741·74 : 583·4

15·4 % uloga = $\frac{15 \cdot 4 \cdot 9086 \cdot 35}{100} = 1399 \cdot 30\,K$

Ukupni dobitak iznosi dakle
1399·30 + 208·53 = 1607·83 K

A dobije $\frac{1607 \cdot 83}{492 \cdot 13 + 741 \cdot 74 + 583 \cdot 4} \cdot 492 \cdot 13 = 435 \cdot 41$

B " $\frac{1607 \cdot 83}{492 \cdot 13 + 741 \cdot 74 + 583 \cdot 4} \cdot 741 \cdot 74 = 656 \cdot 26$

C " $\frac{1607 \cdot 83}{492 \cdot 13 + 741 \cdot 74 + 583 \cdot 4} \cdot 583 \cdot 4 = 516 \cdot 16$

12.) Omjerni su brojevi 2000 : 3400 : 1800 ili
10 : 17 : 9

A plati $\frac{1440}{10+17+9} \cdot 10 = 40 \cdot 10 = 400\,K$

B " $\frac{1440}{10+17+9} \cdot 14 = 40 \cdot 17 = 680\,K$

C " $\frac{1440}{10+17+9} \cdot 9 = 40 \cdot 9 = 360\,K$

13.) Omjerni su brojevi 2 : 3

I. dio = $\frac{60}{2+3} \cdot 2 = 12 \cdot 2 = 24$

II. " $\frac{60}{2+3} \cdot 3 = 12 \cdot 3 = 36$

14.) Omjerni su brojevi $\frac{5}{2} : \frac{2}{3}$ ili 15 : 4

I. dio = $\frac{228}{15+4} \cdot 15 = 12 \cdot 15 = 180$

II. " = $\frac{228}{15+4} \cdot 4 = 12 \cdot 4 = 48$

15.) Plaće se odnose kao $\frac{1}{2} : \frac{5}{4} : 3$
Prinosi su u obrnutom omjeru t.j.:
$2 : \frac{4}{5} : \frac{1}{3}$ ili 30 : 12 : 5

Mjesto A plati $\frac{3760}{30+12+5} \cdot 30 = 80 \cdot 30 = 2400\,K$

" B " $\frac{3760}{30+12+5} \cdot 12 = 80 \cdot 12 = 960\,K$

" C " $\frac{3760}{30+12+5} \cdot 5 = 80 \cdot 5 = 400\,K$

16.) Treba najprije odbiti od 2710 K 6%
od 2710 K što dobije A. 2710 - 6·27·10 =
= 2547·40 K /: 6% od 2710 = 162·60 K :/
Omjerni su brojevi $\frac{1}{4} : \frac{1}{3} : \frac{5}{12}$ ili 3 : 4 : 5

A dobije $\frac{2547 \cdot 40}{3+4+5} \cdot 3 + 162 \cdot 60 = 799 \cdot 45\,K$

B " $\frac{2547 \cdot 40}{3+4+5} \cdot 4 = 849 \cdot 13\,K$

C " $\frac{2547 \cdot 40}{3+4+5} \cdot 5 = 1061 \cdot 416\,K$

17.) A dobije 1 dio, B 2 dijela, a C 3 puta
toliko kao B t.j. 6 dijelova.
Omjerni su brojevi dakle 1 : 2 : 6

A dobije $\frac{3060}{1+2+6} \cdot 1 = 340\,K$

B " $\frac{3060}{1+2+6} \cdot 2 = 340 \cdot 2 = 680\,K$

C " $\frac{3060}{1+2+6} \cdot 6 = 340 \cdot 6 = 2040\,K$

18.) A dobije 1 dio. B dobije onoliko puta po 3K koliko se puta nalaze 2K u dijelu od A t.j. $\frac{3}{2}$ dijela od A. C dobije onoliko puta po 5K koliko se puta 4K nalaze u dijelu od B t.j. ($\frac{3}{2}$ dijela : 4) . 5 = $= \frac{3}{8} \cdot 5 = \frac{15}{8}$ dijela od A.

Omjerni su brojevi $1 : \frac{3}{2} : \frac{15}{8}$ ili 8 : 12 : 15

A dobije $\frac{5600}{8+12+15} \cdot 8 = 1280$ K

B " $\frac{5600}{8+12+15} \cdot 12 = 1920$ K

C " $\frac{5600}{8+12+15} \cdot 15 = 2400$ K

19.) A dobije 1 dio. B dobije onoliko puta po 4K koliko se puta nalaze 3K u dijelu od A t.j. $\frac{4}{3}$ dijela od A. C pak onoliko puta po 4K koliko se puta nalaze 3K u dijelu od B t.j. $\frac{4}{3}$ B-ovog dijela = $\frac{4}{3} \cdot \frac{4}{3}$ A-ovog dijela = $\frac{16}{9}$ A ovog dijela. D napokon dobije onoliko puta po 5K koliko se puta nalaze 3K u B-ovom dijelu t.j. $\frac{5}{3}$ B-ovog dijela = $= \frac{5}{3} \cdot \frac{4}{3}$ A ovog dijela = $\frac{20}{9}$ A-ovog dijela.

Omjerni su brojevi $1 : \frac{4}{3} : \frac{16}{3} : \frac{20}{9}$ ili 9 : 12 : 16 : 20

A dobije $\frac{2280}{9+12+16+20} \cdot 9 = 40 \cdot 9 = 360$ K

B " $\frac{2280}{9+12+16+20} \cdot 12 = 40 \cdot 12 = 480$ K

C " $\frac{2280}{9+12+16+20} \cdot 16 = 40 \cdot 16 = 640$ K

D " $\frac{2280}{9+12+16+20} \cdot 20 = 40 \cdot 20 = 800$ K

20.) Uložio je svaki svotu proporcionalnu svom dobitku. Omjerni su brojevi 60 : 100 : : 160 : 80 ili 3 : 5 : 8 : 4

A je uložio $\frac{3190}{3+5+8+4} \cdot 3 = 159.5 \cdot 3 = 478.5$ K

B " " $\frac{3190}{3+5+8+4} \cdot 5 = 159.5 \cdot 5 = 797.5$ K

C " " $\frac{3190}{3+5+8+4} \cdot 8 = 159.5 \cdot 8 = 1276.0$ K

D " " $\frac{3190}{3+5+8+4} \cdot 4 = 159.5 \cdot 4 = 638.0$ K

21.) a.) Sumpora ima $\frac{145}{17+3+5} \cdot 3 = 5.8 \cdot 3 = 17.4$ kg

b.) Ugljena " $\frac{172.5}{17+3+5} \cdot 5 = 6.9 \cdot 5 = 34.5$ kg

22.) a.) 1 M = 1.17 K ; 1 fr = 0.95 K

Omjerni su brojevi 1 : 0.95 : 1.17 ili 100 : 95 : 117

A dobije $\frac{3744}{100+117+95} \cdot 95 = 12.95 = 1140$ K

B " $\frac{3744}{100+117+95} \cdot 117 = 12.117 = 1404$ K

C " $\frac{3744}{100+117+95} \cdot 100 = 12.100 = 1200$ K

b.) 1 K = $\frac{100}{117}$ marake ; 1 fr = 0.95 K = $\frac{95}{117}$ marka

Omjerni su brojevi $\frac{95}{117} : 1 : \frac{100}{117}$ ili 95 : 117 : 100

A dobije $\frac{7176}{95+117+100} \cdot 95 = 23.95 = 2185$ mar.

B " $\frac{7176}{95+117+100} \cdot 117 = 23.117 = 2691$ "

C " $\frac{7176}{95+117+100} \cdot 100 = 23.100 = 2300$ "

c.) 1 K = $\frac{100}{95}$ franka ; 1 marka = 1.17 K = $\frac{117}{95}$ franka

Omjerni su brojevi $1 : \frac{117}{95} : \frac{100}{95}$ ili 95 : 117 : 100

A dobije $\frac{5616}{95+117+100} \cdot 95 = 18.95 = 1710$ franaka

B " $\frac{5616}{95+117+100} \cdot 117 = 18.117 = 2106$ "

C " $\frac{5616}{95+117+100} \cdot 100 = 18.100 = 1800$ "

23.) Onjemni su brojevi $\frac{1}{2}:\frac{1}{3}:\frac{1}{4}$ ili $\frac{6}{12}:\frac{4}{12}:\frac{3}{12}$

t.j. 6:4:3

Prvi dobije $\frac{3120}{6+4+3}\cdot 6 = 240.6 = 1440$ K

Drugi " $\frac{3120}{6+4+3}\cdot 4 = 240.4 = 960$ K

Treći " $\frac{3120}{6+4+3}\cdot 3 = 240.3 = 720$ K

24.) C je uložio ostatak potrebnog novca t.j.

$1-\frac{2}{5}-\frac{1}{4}=\frac{7}{20}$. $\frac{7}{20}$ potrebnog novca = 637 K

$\frac{20}{20}=1$ = cio potrebni novac = $637\cdot\frac{20}{7}=1820$ K

/: Primjer: $\frac{1}{2}$ potr. novca = 20K, cio potr. nov. = $20.\frac{2}{1}=40$K :/

A je uložio $1820.\frac{2}{5}=728$K ; B je uložio $1820.\frac{1}{4}=455$K.

Onjemni su brojevi $\frac{2}{5}:\frac{1}{4}:\frac{7}{20}$ ili 8:5:7.

Mogu se uzeti kao onjemni brojevi i sume što ih je pojedini uložio: 728:455:637 ili 8:5:7.

A dobije $\frac{1020}{8+5+7}\cdot 8 = 51.8 = 408$ K

B " $\frac{1020}{8+5+7}\cdot 5 = 51.5 = 255$ K

C " $\frac{1020}{8+5+7}\cdot 7 = 51.7 = 357$ K

25.) Ostatak što ga je dao D iznosi:

$1-\frac{1}{3}-\frac{1}{4}-\frac{1}{5}=1-\frac{20}{60}-\frac{15}{60}-\frac{12}{60}=\frac{13}{60}$

$\frac{13}{60}$ skupljene svote = 520K

$\frac{60}{60}=1$ " " $= 520\cdot\frac{60}{13}=2400$K

II. Sastavljeno diobeno pravilo

1.) A pošalje 12 grudina 10 dana = 120 | 10
B " 6 " " 4 " = 24 | 2
C " 12 " " 15 " = 180 | 15

405 : 27 = 15

/: Nastavak na drugoj str. :/

A dobije 15.10 = 150K
B " 15.2 = 30K
C " 15.15 = 225K

2.) A ima 12 krava 20 dana = 240 | 2 A plati 5·5·2 = 11K
B " 15 " 24 " = 360 | 3 B " 5·5·3 = 16·5K
C " 20 " 18 " = 360 | 3 C " 5·5·3 = 16·5K

44 : 8 = 5·5

3.) A pošalje 50+150 grudi na 3 dana = 600 | 2
B " 36+60 " " $12\frac{1}{2}$ " = 1200 | 4
C " 24+108 " " 25 " = 3300 | 11

7140 : 17 = 420

A dobije 420.2 = 840K
B " 420.4 = 1680K
C " 420.11 = 4620K

4.) A je radio 8 dana po 5 sati = 40 | 40
B " " 9 " " 7 " = 63 | 63
C " " 12 " " 4 " = 48 | 48
D " " 10 " " 6 " = 60 | 60
E " " 15 " " 4 " = 60 | 60
F " " 6 " " 8 " = 48 | 48

143·55 : 319 = 0·45

A dobije 0·45.40 = 18 K
B " 0·45.63 = 28·35K
C " 0·45.48 = 21·60K
D " 0·45.60 = 27·00K
E " 0·45.60 = 27·00K
F " 0·45.48 = 21·60K

5.) A je uložio 1500 na 1 g = 1500 | 45
B " " 1200 " $\frac{1}{2}$ g = 600 | 18
C " " 100 " $\frac{2}{3}$ g = $\frac{2000}{3}$ | 20
996 : 83 = 12

A dobije 12.45 = 540 K
B " 12.18 = 216 K
C " 12.20 = 240 K

6.) A je držao 20 ljudi 28 dana = 560 | 28
B " " 25 " 20 " = 500 | 25
C " " 24 " 30 " = 720 | 36
D " " 30 " 16 " = 480 | 24
1627.20 : 113 = 14.40

A dobije 14.40.28 = 403.20 K
B " 14.40.25 = 360.00 K
C " 14.40.36 = 518.40 K
D " 14.40.24 = 345.60 K

7.) M je pozajmio od A 726 K po 4% = 29.04 | 363
" " " B 1280 K " $3\frac{4}{5}$% = 48.64 | 608
" " " C 864 K " $5\frac{3}{4}$% = 49.68 | 621
1178.08 : 1592 = 0.74

A dobije 0.74.363 = 268.62 K
B " 0.74.608 = 449.92 K
C " 0.74.621 = 459.54 K

8.) A trguje sa 8000 K 1 god = 8000 | 96
B " " 4000 K $\frac{3}{4}$ " = 3000 | 36
C " " 5000 K $\frac{7}{12}$ " = $\frac{8750}{3}$ | 35
1336 : 167 = 8

A dobije 8.96 = 768 K, B dobije 8.36 = 288 K
C " 8.35 = 280 K

9.) A za 4 sata 15 hl = 60 | 30 A dobije 18.30 = 540 hl
B " 3 " 16 " = 48 | 24 B " 18.24 = 432 hl
C " 5 " 14 " = 70 | 35 C " 18.35 = 630 hl
D " 2 " 9 " = 18 | 9 D " 18.9 = 162 hl
1764 : 98 = 18

10.) Općina A ima 260 kuća 2 Km udaljeno
" B " 360 " 4 " "
" C " 400 " 4 " "
" D " 560 " 8 " "

Omjerni su brojevi za broj kuća 13 : 18 : 20 : 28
Za udaljenost bi bili 1 : 2 : 2 : 4
Budući da omjer za udaljenosti treba da budne obrnut, biće 4 : 2 : 2 : 1. Tako dobijemo konačne omjerne brojeve:
13.4 : 18.2 : 20.2 : 28.1 ili 13 : 9 : 10 : 7
Općina A plati $\frac{39624}{13+9+10+7} \cdot 13 = 1016.13 = 13208$ K
" B " $\frac{39624}{13+9+10+7} \cdot 9 = 1016.9 = 9144$ K
" C " $\frac{39624}{13+9+10+7} \cdot 10 = 1016.10 = 10160$ K
" D " $\frac{39624}{13+9+10+7} \cdot 7 = 1016.7 = 7112$ K

11.) A je izgubio $\frac{1260}{1400} = \frac{9}{10}$ svoga imetka
B " " $\frac{1700}{8500} = \frac{1}{5}$ " "
C " " $\frac{7200}{7200} = 1$ " "

Omjerni su brojevi $\frac{9}{10} : \frac{1}{5} : 1$ ili 9 : 2 : 10
A dobije $\frac{5040}{9+2+10} \cdot 9 = 240.9 = 2160$ K
B " $\frac{5040}{9+2+10} \cdot 2 = 240.2 = 480$ K
C " $\frac{5040}{9+2+10} \cdot 10 = 240.10 = 2400$ K

12.) Omjerne brojeve za udaljenost treba uzeti obrnuto:

A $\frac{2400.360.150}{6} = 45$ | A plati 325.45 = 14625 K
B $\frac{1800.320.180}{4} = 54$ | B " 325.54 = 17550 K
C $\frac{1600.240.120}{3} = 32$ | C " 325.32 = 10400 K

42575 : 131 = 325

Primjedba: brojevi 45, 54 i 32 nisu općenito razlomaka, nego već skraćeni omjerni brojevi.

13.) A 8 radnika na 8 dana = 64 | 32
B 12 " " 5 " = 60 | 30
C 15 " " 6 " = 90 | 45

963 : 107 = 9

A dobije 9.32 = 288 K
B " 9.30 = 270 K
C " 9.45 = 405 K

14.) Gospođe 12 po 1K = 12 | 60
Gospođa 14 po 0·5 = 7 | 35
djece 18 po 0·2K = 3·6 | 18

56·50 : 113 = 0·5

Svaka je gospođa dala $\frac{0{\cdot}5.60}{12} = 2{\cdot}5$ K
Svaka je gospođa dala $\frac{0{\cdot}5.35}{14} = 1{\cdot}25$ K
Svako je dijete dalo $\frac{0{\cdot}5.18}{18} = 0{\cdot}50$ K

§ 41. Poprečni račun.

Izostavljeno radi jednostavne izradbe.

§ 42. Račun smjese.

1.) 1. vrsta 50 h | 20 | 2 Na svaka 2 kg lošije
60 vrste mora uzeti
2. " 80 h | 10 | 1 1 kg bolje vrste

180 : 3 = 60

Lošije vrste 60.2 = 120 kg; bolje vrste 60 kg

2.) 1. vrsta 36 h | 20 | 5 Na 5 kg lošije
40 vrste 1 kg bolje vrste.
2. " 60 h | 4 | 1

168 : 6 = 28

Lošije vrste 28.5 = 140 kg; bolje vrste 28 kg

3.) 1 vrsta 46 | 22 | 11 Omjerni su brojevi:
62 11 : 8
2 " 84 | 16 | 8

228 : 19 = 12

Krčmar će pomiješati 12.11 = 132 l lošijeg i 12.8 = 96 l boljeg vina.

4.) 1 vrsta 3·80 | 0·15 | 3 Omjerni su brojevi
3·55 3 : 5
2 " 3·40 | 0·25 | 5 9·6 : 8 = 1·2

Trgovac će uzeti 1·2.3 = 3·6 kg bolje vrste i 1·2.5 = 6 kg lošije vrste.

5.) 1 vrsta 0·700 | 0·150 | 3 Omjerni su brojevi
0·750 3 : 1
2 " 0·900 | 0·050 | 1

23·4 : 4 = 5·85

Treba uzeti prebra od čistine 9·700
5·85.3 = 17·55 kg i prebra od 0·900 čistine 5·85 kg

6.) 1. vrsta (voda) 0 | 16 | 1
64
2. " 80 | 64 | 4
Na 4l vina 1l vode
" 30l ↑ " x ↑ "
x : 1 = 30 : 4 x = 7·5l vode.

7.) 1. vrsta 90 | 5 | 1 Omjerni su brojevi
70 1 : 4
2. " 65 | 20 | 4
720 : 5 = 144
Treba uzeti 144.1 = 144l prve vrste i
144.4 = 576l druge vrste.

8.) 1. vrsta 60 | 6 | 3
40
2 " 76 | 10 | 5
Na 3l lošije vrste 5l bolje vrste
" 135l " ↑ " x ↑ " "
x : 5 = 135 : 3 x = 225l bolje vrste

9.) 1. voda 15° | 6 | 2
24°
2 " 30° | 9 | 3
Na 2hl vode od 15° treba dolitи 3hl vode od 30°
" 4hl " " " " " x " " "
x = 6hl vode od 30°

10.) bakar 0 | 0·300 | 6 Bakar =
0·550
srebro 0·850 | 0·550 | 11 = 3.6 = 18dkg
57 : 17 = 3

11.) i 12.) Izradi po 3. zadatku u tumačenju u knjizi.

13.) Bakar 0 | 4 | 2 Na 5kg 14-tinog srebra 2kg bakra
10
srebro 14 | 10 | 5 " ½ kg " ↑ " " x ↑ "
x : 2 = ¼ : 5 x = 1/10 kg = 100g

14.) Izradi po 3. zadatku u tumačenju u knjizi.

15.) bakar 0 | 0·150 | 3
0·850
čisto srebro 1·000 | 0·850 | 17
Na 17kg čista srebra 3kg bakra
" 6·8 ↑ " " x ↑ "
x : 3 = 6·8 : 17 x = 1·2kg bakra

16.) bakar 0 | 0·250 | 5
0·700
zlato 0·950 | 0·700 | 14
Na 14 dijelova zlata od 0·950 čistine 5 dijel. bakra
" 4·2 ↑ " " " " " " x ↑ " "
x : 5 = 4·2 : 14 x = 1·5kg bakra

17.) Mora dodati: 6 − 4½ = 1½ kg srebra nepoznate čistine.
U 6kg srebra čistine 0·800 ima 6.0·800 = 4·8kg čista srebra. U 4·5 kg srebra čistine 0·850 ima 4·5.0·850 = 3·825kg čista srebra.
U 1½ kg srebra nepoznate čistine ima dakle 4·5 − 3·825 = 0·975kg čista srebra, t.j. njegova je čistina 0·975 / 1·5 = 0·650.

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§. 43. Skraćeno računanje.

Izostavljeno radi jednostavnijeg rada.

§ 44. Skraćeno zbrajanje i
§. 45. Skraćeno oduzimanje.

1.) 6·05328 6·053
27·5821 + 27·582
53·4358 53·436
0·80738 0·807
87·87138 = 87·8

2.) $58{\cdot}878787$ + $2{\cdot}76348$ + $24{\cdot}248248$ + $0{\cdot}777777$

$58{\cdot}87879$
$2{\cdot}76348$
$24{\cdot}24825$
$0{\cdot}77778$
$86{\cdot}668330 = 86{\cdot}66683$

3.) $2{\cdot}345\ldots$ + $0{\cdot}5920\ldots$ + $5{\cdot}37902$ + $4{\cdot}3563\ldots$

$2{\cdot}345$
$0{\cdot}593$
$5{\cdot}379$
$4{\cdot}356$
$12{\cdot}6733 = 12{\cdot}67$

4.) $5{\cdot}82 \cdot 74_0 + 837_{000} + 4300$

Budući su kod trećeg sumanda samo decimalne poznate otpada 1. i 4. sumand, jer ne utiču na znamenku desetitisućica

74_0
837_{000}
0

1000
837_{000}
$838000 = 84_{0000}$

5.) a.) $756{\cdot}5847 - 374{\cdot}583625$

$756{\cdot}585$
$374{\cdot}584$
$382{\cdot}001 = 382{\cdot}00$

b.) $34{\cdot}742742\ldots - 17{\cdot}876767\ldots$

$34{\cdot}74274$
$17{\cdot}87677$
$16{\cdot}865971 = 16{\cdot}8660\ldots$

6.) a) $25{\cdot}382\ldots \cdot 7{\cdot}235\ldots$

$18{\cdot}147$

b.) $48{\cdot}33\ldots \cdot 12{\cdot}57\ldots$

$35{\cdot}76$

c.) $324{\cdot}2456\ldots \cdot 193{\cdot}9354\ldots$

$130{\cdot}3102$

d.) $9{\cdot}45 \cdot 0{\cdot}28\ldots$

$9{\cdot}17$

e.) $13{\cdot}73 \cdot 2{\cdot}38$

$11{\cdot}35$

f.) $5{\cdot}3636 \cdot 3{\cdot}2845$

$2{\cdot}0791$

7.) a.) $2\frac{5}{17} = 2{\cdot}294111\ldots$ $\quad \frac{8}{13} = 0{\cdot}61538\ldots$ $-$

$2{\cdot}2941$
$0{\cdot}6154$
$1{\cdot}67871$

b.) $1\frac{2}{3} = 3{\cdot}0538\ldots$ $\quad 1{\cdot}66666\ldots$ $-$

$3{\cdot}0538$
$1{\cdot}6667$
$1{\cdot}38721$

c.) $3\frac{1}{7} = 3{\cdot}142857$ $\quad 1{\cdot}3281$ $-$

$3{\cdot}1429$
$1{\cdot}3281$
$1{\cdot}81488$

§46. Skraćeno množenje.

1.) $73{\cdot}4582 \times 358{\cdot}0926$ na 2 dec tačno = 3 dec

$358{\cdot}0926$
$28\,5437$
25066482
1074278
143237
17905
2864
72
26304838

2.) $0{\cdot}957063 \times 0{\cdot}56347$ na 3 dec tačno = 4 dec

$0{\cdot}95703$
$74\,365$
4785
574
29
4
$0{\cdot}53928$

3.) $732{\cdot}46 \times 3{\cdot}530272$ na 1 dec tačno = 2 dec

$732{\cdot}46$
2720353
219738
36623
2197
15
5
$2585{\cdot}78$

4.) $35726{\cdot}450 \times 0{\cdot}073542$ na 3 dec tačno = 4 dec.

$35726{\cdot}450$
24537
25008515
1071794
178632
14290
714
$2627{\cdot}3945$

5.) 8354·62 x 26·436 na jedinice tačno = 1 dec.

8354·62
63462

1670924
501277
33418
2506
501

220862·6

6.) 783024·8366 x 34·752
na desetine tačno = 2 dec

783024·8366
25743

2349074510
31320934
5481738
3915124
156605

27211679·11

7.) 235·75 x 1·85493

235·75
3945·81

23575
18860
1179
94
21
1

437390 km

8.) 50995370 0
9277371

50995370 0
35696759 0
1529861 1
3569676
356967
10199
4589

88616133 2

9.) Ekvator ima 360·15 = 5400 geogr. milja

7419·728
0045

371
30

40100 km

10.) 56·3472 x 7·3964 x 0·864 na 2 dec. tačno = 3 dec
na 1 dec. na 3 dec.

56·3472
7·3964

394431
16904
5072
394
28

416·76

416·76
468

333408
250056
16676

360·081

11.) 27·0483 x 63·4057 x 0·72834 na 1 dec
na 1 dec. na 2 dec.
tačno = 2 dec

27·0483
75436

162298
8111
1082
1

1714·9

1714·9
4382·7

120043
3430
1371
51
7

1249·02

12.) 0·8379 x 78·536 x 0·038724 na 5 dec.
na 4 dec. na 6 dec.
tačno = 6 dec.

0·8379
463587

5865 30
670 32
41 90
2 51
50
3

65·8056

65·8056
42783

1974168
526445
46064
1316
263

2·548256

na jedinice na 2 dec.

13.) 208·79 x 6435 x 0·00734 na 1 dec. tačno = 2 dec

208·79
5346

1252740
83510
6264
1044

1343564

1343564
7437437

940495
40307
5374
940
40
5
1

9871·62

14.) 8·345 x 0·7348 x 7·2345 x 28·276 na 2 dec.
4 dec. 4 dec. 3 dec.
tačno = 3 dec.

8·3455
8437

58419
2504
334
66

6·1323

6·1323
54327

429261
12265
1840
245
31

44·3642

44·3642
67282

887284
354913
8873
3105
266

1254·441

Množenje nepotpunih decimalnih brojeva.

1.) $3{\cdot}74020\ldots \times 7{\cdot}34$

$3{\cdot}74020$
437
$26\,18\,14$
$11\,221$
1496
$27{\cdot}45\,31$

2.) $72{\cdot}45\,36 \times 6{\cdot}238$

$72{\cdot}45\,36$
8326
$\overline{434\,7216}$
144907
21736
5796
$\overline{451{\cdot}9655}$

3.) $4{\cdot}73824 \times 372{\cdot}345$

$4{\cdot}73824$
$54\,3273$
14215
3317
95
14
2
$\overline{1764{\cdot}2}$

4.) $0{\cdot}006347\ldots \times 38{\cdot}3476$

$0{\cdot}006347$
674383
1904
507
19
2
$\overline{0{\cdot}2432}$

5.) $57{\cdot}43827\ldots \times 5457$

$57{\cdot}43827$
7543
172314
22975
2872
402
$\overline{1985\,6{\cdot}3}$

6.) $0{\cdot}349572\ldots \times 0{\cdot}4376$

$0{\cdot}349572$
67340
139829
10487
2447
209
$\overline{0{\cdot}152973}$

7.) a.) $\frac{5}{7} \times 248{\cdot}35 = 0{\cdot}714285\ldots \times 248{\cdot}35$

$0{\cdot}714285$
53842
142857
28571
5714
214
36
$\overline{177{\cdot}392}$

b.) $0{\cdot}37 \times 72{\cdot}65$

$0{\cdot}373737$
5627
261616
7475
2242
186
$\overline{27{\cdot}151\,4}$

c.) $2{\cdot}047 \times 0{\cdot}3284$

$2{\cdot}04747$
4823
6142
409
163
8
$\overline{0{\cdot}6722}$

d.) $\frac{5}{11} \times \frac{23}{32} = 0{\cdot}54 \times 0{\cdot}71875$

$0{\cdot}5454$
57817
3818
55
43
4
$\overline{0{\cdot}3920}$

8.) $72{\cdot}54\ldots \times 245{\cdot}342\ldots$

$245{\cdot}342$
4527
$1717\,3940$
490684
122671
9814
$\overline{1779{\cdot}7109}$

9.) $43{\cdot}5637\ldots \times 7{\cdot}263\ldots$

$43{\cdot}5637$
3627
3049459
87127
26138
1307
$\overline{316{\cdot}4031}$

10.) $532{\cdot}48\ldots \times 7354{\cdot}278\ldots$

$7354{\cdot}278$
84235
$3677\,13900$
$2206\,2834$
$147085\,6$
$29417\,1$
$5883\,4$
$\overline{3916\,0{\cdot}0595}$

11.) $0{\cdot}25784\ldots \times 4{\cdot}48$

$0{\cdot}25784$
844
10312
1031
206
$\overline{1{\cdot}1559}$

12.) $572{\cdot}384 \times 3{\cdot}14149\ldots$

$572{\cdot}384$
$95\,1413$
$1717\,1520$
572384
228954
5724
2262
515
$\overline{1798{\cdot}1759}$

13.) $0{\cdot}0736 \times 26{\cdot}367\ldots$

$0{\cdot}0736$
76362
14720
4416
221
44
5
$\overline{1{\cdot}9466}$

14.) 0·0843... × 0·074263...

0·074263
348

594
30
2

0·0626

15.) 2437·5783... × 5·8023

2437·5783
32085

12187891 5
19500626
48751
7313

14143·5505

16.) 6·357... × 5·8023...

6·357
32085

317850
50856
127
19

36·8852

17.) 428·63... × 528·63...

428·63
36825

21431500
856260
343104
25718
1286

2265·7868

§ 47. Skraćeno dijeljenje.

1.) 74·38026 : 4·54732 = 16·59

2891
263
36
==

2.) 5038·247 : 68·32546 = 75·202

35546
1383
17
3

3.) 26·58347 : 0·63700 = 41·732

265·8347 : 6·3700 = 41·732

11034
4664
205
14

4.) 0·73824 : 2·34275 = 0·3151

354
120
==3
1

5.) 0·635025 : 37·43 = 0·01696

2607
301
24
2

6.) 0·048372 : 542·7 = 0·0000891

493
==6
1

7.) 0·008356 : 0·0473 =

0·8356 : 4·730 = 0·1766

3626
315
31
3

8.) 376·8539 : 0·00637 =

376853·9 : 6·3700 = 59160·—

58353
1023
386
==4

9.) 438·07 : 0·635 =

4380·70 : 6·3563 = 689·19

56692
5842
122
60
3

10.) 14 : 0·73562 =

14000 : 7·3562 = 19·03

6644
24
2

11.) 1 : 0·3254 =

10000 : 3·254 = 3·073

238
10

12.) 96360 : 859·4367 = 112·12

10416
1822
163
17

13.) 499·86 : 526·38 = 0·949

261
57
4

14.) 625·750 : 1·17000 = 536·026
40750
7050
30
7

15.) 1000 : 4·175 =
10000000 : 4175000 = 239·5164
1650000
397500
21750
685
267
17
1

Dijeljenje nepotpunih brojeva.

1) 847·56... : 28·3 = 29·949
00
28156
2686
139
26
1

2.) 0·7345... : 7·4653 = 0·0983
626
29
7

3) 0·042957... : 0·328 = 0·011245
00
4757
931
173
20
1

4.) 749·5 : 32·5283... = 23·04
989
13
= =

5.) 0·4356 : 0·853... = 0·0510
= = 41
= 6

6.) 75·4053... : 2·348... = 32·1147
00
49653
2693
345
110
16
= =

7.) 2743·28... : 83·245... = 32·954
24593
7944
452
36
3

8.) 0·823457... : 0·2834... = 2·90563
00
256657
1597
180
10
2

9.) 0·054634... : 0·0735... = 0·007133
0
3184
244
23
1

10.) 0·7356... : 23·74... = 0·03099
234
21
= =

Primjeri izostavljena zadnji jednostavne izvedbe.

Opća aritmetika.

§48. Opći brojevi.

1.) a.) $20-(6+5)=20-11=9$

b.) $18-(7-3)=18-4=14$

c.) $45-3(7+4)=45-3\cdot 11=45-33=12$

d.) $45-(3\cdot 7+4)=45-(21+4)=45-25=20$

e.) $(45-3)\cdot 7+4=42\cdot 7+4=294+4=298$

f.) $(45-3)(7+4)=42\cdot 11=462$

g.) $(10-4):2=6:2=3$

h.) $10-4:2=10-2=8$

i.) $44-16:(7-3)=44-16:4=44-4=40$

k.) $(44-16):7-3=28:7-3=4-3=1$

l.) $(44-16):(7-3)=28:4=7$

2.) a.) $20-(18-5)-(2+3)=20-13-5=7-5=2$

b.) $20-[18-(5-2)+3]=20-[18-3+3]=2$

c.) $20-[18-\{5-[2+3]\}]=20-[18-(5-5)]=20-[18-0]=2$

d.) $20-[(18-5)-(2+3)]=20-[13-5]=20-8=12$

e.) $20-[18-(5-2+3)]=20-[18-6]=20-12=8$

3.) a.) $42-(24:4-2)+4\cdot 3:6-2=42-(6-2)+2-2=42-4=38$

b.) $(42-24):(4-2)+4\cdot 3:(6-2)=18:2+12:4=9+3=12$

c.) $[(42-24):(4-2+4)]\cdot 3:(6-2)=[18:6]\cdot 3:4=3\cdot 3:4=9:4=\frac{9}{4}$

d.) $[42-(24:4-2+4)\cdot 3]:(6-2)=[42-(6-2+4)\cdot 3]:4=[42-8\cdot 3]:4=18:4=\frac{18}{4}=\frac{9}{2}$

e.) $(42-24):[(4-2)+4\cdot 3:(6-2)]=18:[2+12:4]=18:[2+3]=18:5=\frac{18}{5}$

4.) a.) $5\cdot 6\cdot 8:4=5\cdot 6\cdot 2=60$

b.) $5\cdot(6\cdot 8:4)=5\cdot 6\cdot 8:4=5\cdot 6\cdot 2=60$

c.) $5\cdot 6\cdot(8:4)=5\cdot 6\cdot 8:4=5\cdot 6\cdot 2=60$

5.) Ne smije, jer je inače $a+bx$ mjesto $(a+b)x$ t.j. mjesto: ž.broj od a i b ima se pomnožiti sa x, glasi izraz: broju a ima se pribrojiti produkat od b i x. Isto je $a:b+c$ mjesto $a:(b+c)$ t.j. mjesto: broj a ima se podijeliti sa ž.brojem od b i c glasi izraz: kvocientu od a i b ima se pribrojiti broj c.

6.) $(a+b)m$ 7.) $(a+b)(a+b)$

8.) $(m+n)(m-n)$

9.) Prvi izraz glasi: razlika od a i b množi se sa razlikom od c i d.

Drugi izraz glasi: Od produkta broja c i razlike od a i b ima se odbiti broj c.

Treći izraz glasi: od broja a ima se odbiti produkat od broja b i razlike od c i d.

Četvrti izraz glasi od broja a ima se odbiti produkat od b i c i broj d.

10.) $100-(8+3)\cdot 5=100-55=45$

11.) $5-[10-(12-4)=5-[10-8]=5-2=3$

Vježbe II.

1.) a.) $4n+2=4\cdot 16+2=64+2=66$

b.) $2n+\frac{n-1}{3}=2\cdot 16+\frac{16-1}{3}=32+5=37$

c.) $\frac{n}{4}+5n=\frac{16}{4}+5.16=4+80=84$

2.) a.) $a-(b-c)=13-(3-1)=13-2=11$

b.) $ab-a(a-c)=13.3-13(13-1)=39-13.12=$
$=39-156=-117.$

c.) $(a-b)(b-c)=(13-3)(3-1)=10.2=20$

d.) $a:b-b:c=13:3-3:1=\frac{13}{3}-3=\frac{4}{3}$

e.) $a(a-b+c)=13(13-3+1)=13.11=143$

f.) $a(b-c)+b(a-c)=13(3-1)+3(13-1)=$
$=13.2+3.12=62$

g.) $ab-bc+ac=13.3-3.1+13.1=39-3+13=49$

h.) $(ab-c)(ac-b)=(13.3-1)(13.1-3)=38.10=380$

i.) $a[(a-c)+b]:b=13[(13-1)+3]:3=13[12+3]:3=$
$=13.15:3=13.5=65$

3.) $(a:b):c=(16:4):2=4:2=2$

$a:(b:c)=16:(4:2)=16:2=8$

4.) a.) $x-[(a-b)(m-n)]=15-[(15-7)(4-2)]=$
$15-[8.2]=15-16=-1$

b.) $x-[a-(b-m-n)]=15-[15-(7-4-2]=$
$15-[15-1]=15-14=1$

c.) $x-[a-(b-m)-n=15-[15-(7-4)-2]=$
$15-[13-3]=15-10=5$

d.) $x-[(a-b-m)-n]=15-[(15-7-4)-2]=$
$=15-[4-2]=15-2=13$

5.) $\frac{a+b+c}{m-n}\cdot d=\frac{1+12+11}{48-18}\cdot 5=\frac{24}{30}\cdot 5=\frac{24}{6}=4$

6.) a.) $ab:c=108.12:6=108.2=216$

b.) $ab:cd=108.12:6.2=108$

c.) $a\cdot\frac{b}{ca}=\frac{a.b}{c.a}=108$ (vidi isti zad. b.)

d.) $(a:b):(c:d)=(108:12):(6:2)=9:3=3$

7.) a.) $\frac{abc}{d:e}=\frac{30.10.5}{8:4}=\frac{30.10.5}{2}=30.5.5=750$

b.) $\frac{ab}{c}:\frac{de}{m}=\frac{30.10}{5}:\frac{8.4}{16}=60:2=30$

8.) Na 1kg dobije $b-a$, a na c kg $c(b-a)$
" " " $5\cdot10-4\cdot8=0\cdot3$
na 80kg dobije $80(5\cdot10-4\cdot8)=80.0\cdot3=24$

9.) Za b kg dobio je bc K. Ostalo mu je $(a-b)$ kg robe. Za taj ostatak dobio je $(a-b)d$ K; u svemu je dakle dobio: $bc+(a-b)d=100.8+(500-100).6=$
$=800+2400=3200$K

10.) $a-6b-c=32-6.3-7=7$
Preostali 7K

11.) Vrijednost od a hl po cK je acK.
" " b " " d " " bdK
Potome je vrijednost pomiješe od $(a+b)$hl $(ac+bd)$K
1hl stoji $\frac{ac+bd}{a+b}=\frac{30.36+8.50}{30+8}=38\cdot94$ K.

I. Zbrajanje i oduzimanje.

§49. Zbrajanje općih brojeva.

1.) $x+x=2x$ 2.) $b+b=2b$ 3.) $3x+x=4x$
4.) $3m+2m=5m$ 5.) $7p+3p=10p$
6.) $4y+y+7y=12y$ 7.) $2a+3a+5a+8a=18a$

8.) $8{\cdot}25a + 5{\cdot}5a + 3{\cdot}75a = 17{\cdot}50a$

9.) $\frac{1}{2}x + \frac{3}{4}x + \frac{4}{5}x = \frac{10}{20}x + \frac{15}{20}x + \frac{16}{20}x = \frac{41x}{20}$

10.) Tonća su četiri cijela broja: $n+4$, $n+5$, $n+6$ i $n+7$.

Njihov je zbroj: $n+4+n+5+n+6+n+7 = 4n+22$

a.) $4n+22 = 26$ (za $n=1$)

b.) $4n+22 = 42$ (za $n=5$)

11.) $(a+3)+4 = a+3+4 = a+7$

12.) $(3x+5)+4x = 3x+5+4x = 7x+5$

13.) $(5x+3a)+6x = 5x+3a+6x = 11x+3a$

14.) $(5b+2y)+3b = 5b+2y+3b = 8b+2y$

15.) 11.) $a+7 = 6+7 = 13$

12.) $7x+5 = 7{\cdot}4+5 = 28+5 = 33$

13.) $11x+3a = 11{\cdot}4+3{\cdot}6 = 44+18 = 62$

14.) $8b+2y = 8{\cdot}3+2{\cdot}2 = 24+4 = 28$

16.)
$$\begin{array}{r} a+4b+3a \\ \underline{3a+2b+a\ +} \\ 4a+6b+4a \end{array} = 8a+6b$$

17.) $[(3x+14y)+2x]+5y = [3x+14y+2x]+5y =$
$= 5x+14y+5y = 5x+19y$

18.) $[(4a+3b)+5a]+6b = [4a+3b+5a]+6b =$
$4a+3b+5a+6b = 9a+9b$

19.) $(5x+3)+(2x+4) = 5x+3+2x+4 = 7x+7$

20.) $(3a+2b+4c)+(8a+5b) = 3a+2b+4c+8a+5b =$
$= 11a+7b+4c$

21.) $(3a+2b)+(9a+8b) = 3a+2b+9a+8b =$
$= 12a+10b$

22.)
$$\begin{array}{r} 2a+5b+8c \\ \underline{10a+7b+4c\ +} \\ 12a+12b+12c \end{array}$$

23.)
$$\begin{array}{r} 0{\cdot}6a+0{\cdot}26b \\ \underline{0{\cdot}3a+1{\cdot}6b\ +} \\ 0{\cdot}9a+1{\cdot}86b \end{array}$$

24.)
$$\begin{array}{r} \frac{2}{3}x+\frac{3}{4}y \\ \underline{\frac{1}{2}x+\frac{1}{3}y\ +} \\ \frac{7}{6}x+\frac{13}{12}y \end{array}$$

25.)
$$\begin{array}{r} 3a+4b+5c+d \\ 2a+b+6c+3d\ + \\ \underline{8a+6b+2c+4d} \\ 13a+11b+13c+8d \end{array}$$
$= 13{\cdot}2+11{\cdot}3+13{\cdot}1+8{\cdot}4 = 104$

26.)
$$\begin{array}{r} 3x+4y+2z \\ 4y+3z+2w \\ 6x+2y+3w\ + \\ \underline{x+4z+u} \\ 10x+10y+9z+6w \end{array}$$

§50. Oduzimanje općih brojeva.

1.) $6a-2a = 4a$ 2.) $8x-5x = 3x$ 3.) $12m-m = 11m$

4.) $6{\cdot}3x-2{\cdot}4x = 3{\cdot}9x$ 5.) $\frac{2}{3}a-\frac{1}{4}a = \frac{8}{12}a-\frac{3}{12}a = \frac{5}{12}a$

6.) $5m+6m-8m = 11m-8m = 3m$

7.) $6b-3b+6b = 3b+6b = 9b$

8.) $8x+7x-9x+2x = 8x$

9.) $20m-5m-6m-2m = 7m$

10.) $3{\cdot}6a-2{\cdot}7a+1{\cdot}8a = 5{\cdot}4a-2{\cdot}7a = 2{\cdot}7a$

11.) $\frac{3}{4}x+\frac{5}{8}x-\frac{2}{3}x-\frac{1}{6}x = \frac{18}{24}x+\frac{15}{24}x-\frac{16}{24}x-\frac{4}{24}x = \frac{13}{24}x$

12.) $5m+10n-2m-6n+3m-n = 6m+3n$

13.) Prethodnica cijela broja zovu se:
$n+4$, $n+3$, $n+2$ i $n+1$.

14.) $(m+6)-2 = m+6-2 = m+4$

15.) $(9x+5y)-4x = 9x+5y-4x = 5x+5y$

16.) $(x-4)+3x = x-4+3x = 4x-4$

17.) $8x-(2x+6) = 8x-2x-6 = 6x-6$

18.) $8m-(3n+m) = 8m-3n-m = 7m-3n$

19.) $5m-(8-2m)=5m-8+2m=7m-8$

20.) $20-(15-4m)=20-15+4m=5+4m$

21.) $(14x+13y)-(12x+3y)=14x+13y-12x-3y=2x+10y$

22.) $5a+3b-(4a+6b)=5a+3b-4a-6b=a-3b$

23.) $7m+2n-(6m-3n)+(m+2n)=7m+2n-$
$-6m+3n+m+2n=2m+7n$

24.) a.) $\begin{array}{r} 3a+6b \\ -2a+4b \\ \hline a+2b \end{array}$ b.) $\begin{array}{r} 12m+8n \\ -8m-6n \\ \hline 4m+14n \end{array}$

c.) $\begin{array}{r} 6a-5b \\ -2a+b \\ \hline 4a-6b \end{array}$ d.) $\begin{array}{r} 15x+5y \\ -12x-3y \\ \hline 3x+8y \end{array}$

25.) a.) $\begin{array}{r} 9a+8b-7c \\ -2a-8b-16c \\ \hline 7a+16b+9c \end{array}$ b.) $\begin{array}{r} 23a-26b+19c-7d \\ -18a+14b-c+8d \\ \hline 5a-40b+20c-15d \end{array}$

26.) $17a+5b-(7a+b)-[3a-(2a-b)]=$
$=17a+5b-7a-b-[3a-2a+b]=$
$=10a+4b-3a+2a-b=9a+3b$

27.) $(15m+12n)-[(4m+n)-(3m-n)]=$
$=15m+12n-[4m+n-3m+n]=$
$=15m+12n-4m-n+3m-n=14m+10n$

28.) $8x+5y-[(4x+3)-(2x+4y)]-(2x+1)=$
$=8x+5y-[4x+3-2x-4y]-2x-1=$
$=6x+5y-1-4x-3+2x+4y=4x+9y-4$

29.) $16a-5b-(2b+3c-2)-(15a-4b-5c+3)=$
$=16a-5b-2b-3c+2-15a+4b+5c-3=$
$=a-3b+2c-1$

30.) $12m-19n+(8m-7n)-[17m-3n+(2n-6m)]=$
$=12m-19n+8m-7n-[17m-3n+2n-6m]=$

$20m-26n-17m+3n-2n+6m=9m-25n$

31.) a.) $10x-8y-(6x-4y)-(2x+y)=$
$=10x-8y-6x+4y-2x-y=2x-5y=16-30=-14$

b.) $10x-8y-[6x-(4y-2x)]+y=$
$=10x-8y-[6x-4y+2x]+y=10x-7y-6x+4y-2x=$
$=2x-3y=16-18=-2$

c.) $10x-(8y-6x)-[4y-(2x+y)]=$
$=10x-8y+6x-[4y-2x-y]=$
$=16x-8y-4y+2x+y=18x-11y=144-66=78$

d.) $10x-[8y-(6x-4y)]-(2x+y)=10x-[8y-6x+4y]-$
$-2x-y=8x-y-8y+6x-4y=14x-13y=112-78=34$

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§ 52. Zbrajanje algebarskih brojeva.

1.) $(+8)+(+5)=8+5=13$ 2.) $7+(-6)=7-6=1$

3.) $93+(-145)=93-145=52$ 4.) $9+(-9)=9-9=0$

5.) $(+148)+(-87)=148-87=61$

6.) $(-12)+(-17)=-12-17=-29$

7.) $(-38)+(+17)=-38+17=-21$

8.) $(-26)+(+49)=-26+49=23$

9.) $(+15a)+(+6a)=15a+6a=21a$

10.) $9m+(-6m)=9m-6m=3m$

11.) $18m+(-24m)=18m-24m=-6m$

12.) $(-13x)+(+8x)=-13x+8x=-5x$

13.) $(-158x)+(+73x)=-158x+73x=-85x$

14.) $-27y+(+27y)=-27y+27y=0$

15.) $a+(+m)=a+m$

16.) $\quad(-5)=a-5$

17.) $-15x+(-16y)=-15x-16y$

18.) $5(a+b)+[-6(a+b)]=5a+5b-6(a+b)=$
$5a+5b-6a-6b=-a-b$

19.) $-3(x+y)+[-8(x+y)]=-3x-3y-8(x+y)=$
$=-3x-3y-8x-8y=-11x-11y$

20.) a.) $(+16K)+(+24K)=+40K$
b.) $(+18K)+(-5K)=18K-5K=13K$
c.) $(+24K)+(-32K)=24K-32K=-8K$
d.) $(-12K)+(-15K)=-12K-15K=-27K$

21.) a.) $(+532m)+(-384m)=+148m$ nad oplom
b.) $(+427m)+(-593m)=427m-593m=-116m$

22.) $(-453g)+(+243g)=-210g$ prije J.
$(-453g)+(+628g)=+175g$ poslije J.

§ 53. Oduzimanje algebarskih brojeva.

1.) $(+15)-(+18)=15-18=-3$
2.) $(+24)-(-13)=24+13=37$
3.) $(-32)-(-45)=-32+45=13$
4.) $(-17)-(-17)=-17+17=0$
5.) $(+2\frac{3}{4})-(+3\frac{1}{2})=2\frac{3}{4}-3\frac{1}{2}=\frac{11}{4}-\frac{7}{2}=\frac{11}{4}-\frac{14}{4}=-\frac{3}{4}$
6.) $(+7a)-(-2a)=7a+2a=9a$
7.) $12-(+4b)=12-4b$
8.) $(-5a)-(-8a)=-5a+8a=3a$
9.) $(-9x)-(+12x)=-9x-12x=-21x$
10.) $(+5a)+(-8)-(+5)=5a-8-5=5a-13$
11.) $(-34)+(+27)-(-32)-(+18)=-34+27+32-18=7$
12.) $(-4a)+(-2a)-(-a)+(+9a)=-4a-2a+a+9a=4a$
13.) $(-9x)+(-x)-(-5x)-(-6x)=-9x-x+5x+6x=x$

14.) $(+1894)-(+1863)=1894-1863=31g$
Od godine smrti oduzima se god. rođenja.

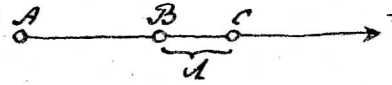
15.) $(+14)-(-63)=14+63=77g$

16.) $(+321)-(-385)=-321+385=64g$

17.) $(+70)-(-2^\circ)=7^\circ+2^\circ=9^\circ$

18.) Prešao je u prvom: $340m+85m+430m+$
$+570m=1425m$
Nalazi se u visini od zemlje:
$(+340m)+(-85m)+(+430m)+(-570m)=$
$=340m-85m+430m-570m=+115m$

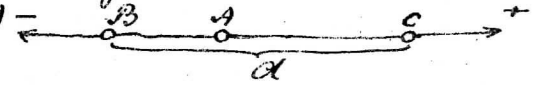
19.) a.)



C je mjesto, gdje će biti prvi parobrod za 1 min.
B " " " " " drugi " " " "
Daljina je od potome $= AC-AB$, ako su AC i AB puteri što ih parobrodi prevale za 1 min. $d=230m-158m=72m$

Isto tako zaključi za udaljenost parobroda iz $\frac{1}{2}h=30min$. Za to je vrijeme svaki parobrod prevalio 30 puta veći put nego za 1 min. Prema tome prevalio je prvi parobrod $30.230m$, a drugi $30.158m$. Udaljenost njihova jednaka je $d=30.230m-30.158m=2160m$

b.)



Desni smjer neka je pozitivan, lijevo negativan. Udaljenost je jednaka $d=$
$=(+AC)-(-AB)=AC+AB$ ako su AC i AB

putari prevaljeni u jednoj minuti.
a je potome = 230 m + 158 m = 388 m
Za $\frac{1}{2}$ h zaključi kao u zadatku a.)
d = (+30 . 230) - (-30 . 158) = 11640 m
20.) $(+70\frac{2}{3}°) - (+45\frac{5}{6}°) = 70\frac{2}{3} - 45\frac{5}{6} = 24\frac{5}{6}°$
Primjedba: sjeverna širina neka je pozitivna, južna negativna.
21.) $(+48\frac{1}{5}°) - (-33\frac{9}{10}°) = 48\frac{1}{5} + 33\frac{9}{10} = 82\frac{1}{10}°$
22.) $(+52) + [(-34) - (-12)] = 52 + [-34 + 12] =$
$= 52 + [-22] = 52 - 22 = 30$
23.) $(-15) - [(+12) - (-8)] = -15 - [12 + 8] = -15 - [+20] =$
$= -15 - 20 = -35$
24.) $(-3a + 4b + 2c) - (-7a - 2b + 3c) =$
$= -3a + 4b + 2c + 7a + 2b - 3c = 4a + 6b - c =$
$= 8 + 24 - 6 = 26$
Pokus: $(-6 + 16 + 12) - (-14 - 8 + 18) = 22 + 4 = 26$
25.) $(5x - y + 2z) - (3x - y - 4z) - (-2x + 3y - 6z) =$
$= 5x - y + 2z - 3x + y + 4z + 2x - 3y + 6z =$
$= 4x - 3y + 12z = 4 - 6 + 36 = 34$
Pokus: $(5 - 2 + 6) - (3 - 2 - 12) - (-2 + 6 - 18) =$
$= 9 + 11 + 14 = 34$
26.) $a - (b - c) - [c - (b - a)] = a - b + c - c + (b - a) =$
$= a - b + c - c + b - a = 0$
Pokus: $-2 - [1 - (-1)] - \{-1 - [1 - (-2)]\} =$
$= -2 - [1 + 1] - \{-1 - [1 + 2]\} = -2 - 2 + 1 + 3 = 0$
27.) $5x - [2y + (3x - 4y) - (x - 2y)] =$
$5x - 2y - (3x - 4y) + (x - 2y) =$
$= 5x - 2y - 3x + 4y + x - 2y = 3x = 9$
Pokus: $15 - [2 + (9 - 4) - (3 - 2)] = 15 - 2 - 5 + 1 = 9$

28.) $2x + y - \{5y + [2x - (3y - 2x)]\} =$
$= 2x + y - 5y - [2x - (3y - 2x)] =$
$= 2x - 4y - 2x + (3y - 2x) = -4y + 3y - 2x =$
$= -y - 2x = -2 - 8 = -10$
29.) $a + \{(a - b) - [a - (3a + b)]\} =$
$= a + (a - b) - [a - (3a + b)] =$
$= a + a - b - a + (3a + b) = a - b + 3a + b =$
$4a = 4$
Pokus: $1 + \{(1 - 2) - [1 - (3 + 2)]\} = 1 + (-1) - [1 - 5] =$
$= 1 - 1 - (-4) = 4$
30.) $2m - \{m + n + [2m - (n + 5m)] + 4m\} =$
$= 2m - m - n - [2m - n - 5m] - 4m =$
$= -3m - n - 2m + n + 5m = 0$
Pokus: $4 - \{2 - 2 + [4 - (-2 + 10)] + 8\} =$
$= 4 - [4 - 8] - 8 = -4 + 4 = 0$

II. Množenje i dijeljenje.

§. 54. Množenje monoma.

1.) $5a \cdot 3 = 15a$ 2.) $6a \cdot x = 6ax$ 3.) $m \cdot 6n = 6mn$
4.) $5x \cdot 3y = 15xy$ 5.) $4ab \cdot 3 = 12ab$ 6.) $7m \cdot 3n = 21mn$
7.) $8ab \cdot 3c = 24abc$ 8.) $7y \cdot y \cdot 3 = 21y^2$
9.) $3a \cdot 4b \cdot 5c = 60abc$ 10.) $a^4 \cdot a^7 = a^{11}$
11.) $x^5 \cdot x = x^6$ 12.) $m^5 \cdot m^3 = m^8$
13.) $2m^3 \cdot 2m^3 = 4m^6$ 14.) $5x^2 \cdot 2x^3 = 10x^5$
15.) $ax^2 \cdot x^2 = ax^4$ 16.) $2ab \cdot 2ab = 4a^2b^2$
17.) $4a^2c \cdot 3a^3 = 12a^5c$ 18.) $5a^2b \cdot 3ab^3 = 15a^3b^4$

19.) $5xy \cdot 8yz = 40xy^2z$

20.) $4m^2n \cdot 5mx^2y^3 = 20m^3nx^2y^3$

21.) $9\frac{1}{3}ax^2y \cdot 6\frac{1}{2}ay^2 = \frac{28}{3}ax^2y \cdot \frac{13}{2}ay^2 = \frac{364}{6}a^2x^2y^2$

22.) $3ax \cdot 5by \cdot 2ab = 30a^2b^2xy$

23.) $4a^2 \cdot 5a^3 \cdot 3a^4 = 60a^9$

24.) $6a^3 \cdot 5x^2 \cdot ax = 30a^4x^3$

25.) $3m^2n \cdot 2m^2n^2 \cdot 4mn^3 = 24m^5n^6$

26.) $5x^3y^2z \cdot 7x \cdot 3x^2y = 105x^6y^3z$

27.) $6a \cdot 3b \cdot 5am \cdot 2bm = 180a^2b^2mn$

28.) $8x^2y^3 \cdot 4x^4z \cdot y^3z^5 = 32x^6y^6z^6$

29.) $ab^2c^3 \cdot 2a^2bd^2 \cdot 3c^3d^4 = 6a^3b^3c^6d^6$

30.) Možemo ovo:

$2abc + 4a^2m + 5am^2 + 2a^2m + 3am^2 =$

$= 2abc + 6a^2m + 8am^2$

31.) a.) $5ab - m + 7ab + ab + 6m - 5ab = 8ab + 5m$

b.) $3a^2b + 4ab^2 + 6a^2b = 9a^2b + 4ab^2$

c.) $6ac + 3bc - 3abc - 2bc + abc + 3bc =$

$= 6ac + 4bc - 2abc$

d.) $x^2y + 5xy - 2x^2y - 3xy^2 = -x^2y + 5xy - 3xy^2$

e.) $a^3 + 2a^2b - 3ab^2 - a^2b + ab^2 + 2a^3 =$

$= 3a^3 + a^2b - 2ab^2 = 3 \cdot 8 + 4 \cdot 4 - 2 \cdot 2 \cdot 16 = -24$

---

§.55. Množenje binoma

I. Vježbe.

1.) $(6+4) \cdot 2 = 10 \cdot 2 = 20$; $(6+4) \cdot 2 = 12 + 8 = 20$

2.) $(100-4) \cdot 6 = 600 - 24 = 576$

3.) $(a+2) \cdot 5 = 5a + 10$

4.) $(x-8) \cdot y = xy - 8y$

5.) $(a+bc)c = ac + bc^2$

6.) $(a-3x)ax = a^2x - 3ax^2$

7.) $(2a^2-b)a^3 = 2a^5 - a^3b$

8.) $(4x^3y+5)2x^4 = 8x^7y + 10x^4$

9.) $[(2x-5y)+4a]3ax^2 = 3ax^2(2x-5y) + 12a^2x^2 =$

$= 6ax^3 - 15ax^2y + 12a^2x^2$

10.) $[5a-(4ab-b)]8ab = 40a^2b - 8ab(4ab-b) =$

$= 40a^2b - 32a^2b^2 + 8ab^2$

11.) $(a+b+c) \cdot 3 = 3a + 3b + 3c$

12.) $(a-b+c) \cdot 4 = 4a - 4b + 4c$

13.) $(b-2a-3x)2ax = 2abx - 4a^2x - 6ax^2$

14.) $(a^2-2ab+b^2)2a^3b^2 = 2a^5b^2 - 4a^4b^3 + 2a^3b^4$

15.) $(9a^3-7a^2+5a-3)5a^6 = 45a^9 - 35a^8 + 25a^7 - 15a^6$

II. Vježbe

1.)
$$\begin{array}{r} (2a+b)(3a+2b) \\ \hline 6a^2+3ab \\ \quad +4ab+2b^2 \\ \hline 6a^2+7ab+2b^2 \end{array}$$

2.) $(x+3)(y+2) =$

$= xy + 3y + 2x + 6$

3.)
$$\begin{array}{r} (3x+4y)(5x+6y) \\ \hline 15x^2+20xy \\ \quad +18xy+24y^2 \\ \hline 15x^2+38xy+24y^2 \end{array}$$

4.) $(2m+4n)(5-6x) =$

$= 10m + 20n - 12mx - 24nx$

5.) $(4x-5)(3y+z) =$

$= 12xy - 15y + 4xz - 5z$

6.) $(7x-6y)(4a+3b) =$

$= 28ax - 24ay + 21bx - 18by$

7.) $(2a-b)(m-n) =$

$= 2am - bm - 2an + bn$

8.)
$$\begin{array}{r} (3a-2b)(2a-b) \\ \hline 6a^2-4ab \\ \quad -3ab+2b^2 \\ \hline 6a^2-7ab+2b^2 \end{array}$$

9.) $(x-2m)(2x-m)$

$$\begin{array}{r} 2x^2-4mx \\ -mx+2m^2 \\ \hline 2x^2-4mx+2m^2 \end{array}$$

10.) $(5a-4b)(3a-2b)$

$$\begin{array}{r} 15a^2-12ab \\ -10ab+8b^2 \\ \hline 15a^2-22ab+8b^2 \end{array}$$

11.) $(5m^2-6n^2)(3m-2n)=15m^3-18mn^2-10m^2n+12n^3$

12.) $(a+3b)^2=a^2+6ab+9b^2$

13.) $(x+4)^2=x^2+8x+16$

14.) $(30+5)^2=900+300+25=1225$

15.) $(3x-4)^2=9x^2-24x+16$

16.) $(2a-3b)^2=4a^2-12ab+9b^2$

17.) $(6m-5n)^2=36m^2-60mn+25n^2$

18.) $(7x-2y)^2=49x^2-28xy+4y^2$

19.) $(5-3x)^2=25-30x+9x^2$

20.) $(50-4)^2=50^2-2\cdot50\cdot4+4^2=2116$

21.) $(2a+b)(2a-b)=4a^2-b^2$ Pogledaj prav. u knjizi!

22.) $(3x+4y)(3x-4y)=9x^2-16y^2$ " "

23.) $(8m+5n)(8m-5n)=64m^2-25n^2$ " "

24.) $(m+1)(m+2)(m+3)=(m^2+3m+2)(m+3)=$
$=m^3+6m^2+11m+6$

$$\begin{array}{r} (m+1)(m+2) \\ m^2+m \\ +2m+2 \\ \hline m^2+3m+2 \end{array} \qquad \begin{array}{r} (m^2+3m+2)(m+3) \\ m^3+3m^2+2m \\ +3m^2+9m+6 \\ \hline m^3+6m^2+11m+6 \end{array}$$

25.) $(x+a)^3+(x-a)^3=(x+a)^2(x+a)+(x-a)^2(x-a)=$
$=(x^2+2ax+a^2)(x+a)+(x^2-2ax+a^2)(x-a)=$
$=x^3+3x^2a+3xa^2+a^3+x^3-3x^2a+3xa^2-a^3=$
$=2x^3+6ax^2$

26.) $[(a+b)+c]^2=(a+b)^2+2(a+b)c+c^2=$
$a^2+2ab+b^2+2ac+2bc+c^2$

III. Vježbe

1.) $(+3)(+4)=+12$ 2.) $(+5)(-2)=-10$

3.) $(-5)(+8)=-40$ 4.) $(-3)(-6)=+18$

5.) $(+2a)(+m)=+2am$ 6.) $(-3x)(+2y)=-6xy$

7.) $(-4x)(-5y)=+20xy$

8.) $(-2m)(8n)=-16mn$

9.) $3ab(-4a^2b)=-12a^3b^2$

10.) $(-6xy)(-3ax)=+18ax^2y$

11.) $(-2\frac{3}{5}abx)(8bx^2x^3)=(-\frac{13}{5}abx)8bx^5=$
$=-\frac{104}{5}ab^2x^6$

12.) Kod trećeg produkta ima valjda tiskarska pogrješka kod predznaka (u izdanju od 1913 svi su produkti negativni.

Pravilo: ako je broj negativnih faktora tak, produkat je pozitivan (jer dva i dva negativna faktora daju pozitivan produkat). Ako je broj negativnih faktora lih, produkat je negativan.

13.) $(-x)(-2y)(+z)=2xyz$

14.) $(-a)(-a)(+a)=a^3$

15.) $(-5a)(+4a)(-3b)=60a^2b$

16.) $2a(-2b)(+a)(-b)=4a^2b^2$

17.) $(-2a)(-2b)(+a)(-b)=-4a^2b^2$

18.) $(-6a)(-3ax)\,5b\cdot2by=180a^2b^2xy$

19.) $(-3)(-7a^2)\,9a^3\cdot5a=21a^2\cdot45a^4=945a^6$

20.) $(-x^3)(-x^2y)(-2xy)(-2x^2)=4x^8y^2$

21.) $[a+(-b)](+a)=+a^2+(-ab)=a^2-ab$

22.) $[a+(+b)](-a)=-a^2+(-ab)=-a^2-ab$

§56. Množenje polinoma.

1.) $(4a-8b+3c)2m = 8am-16bm+6cm$

2.) $(9x-7y-3z)(-6a) = -54ax+42ay+18az$

3.) $(3m^2-6m+1)(-1) = -3m^2+6m-1$

4.) $(-4x^2-7x-5)(3x) = -12x^3-21x^2-15x$

5.) $-7a(-5a^3-9a^2+6a-2) = +35a^4+63a^3-42a^2+14a$

6.) $(2x^2-7xy-12y^2)5x^2y = 10x^4y-35x^3y^2-60x^2y^3$

7.) $(-3a^2+5ab-4b^2)6ab^2+(2a^3-3a^2b+7ab^2-5b^3)9b^2 =$
$= -18a^3b^2+30a^2b^3-24ab^4+18a^3b^2-27a^2b^3+$
$+63ab^4-45b^5 = 3a^2b^3+39ab^4-45b^5$

8.) $(x^2y-2xy^2+4y^3)6x^2+(3x^3+2x^2y-xy^2)3xy =$
$= 6x^4y-12x^3y^2+24x^2y^3+9x^4y+6x^3y^2-3x^2y^3 =$
$= 15x^4y-6x^3y^2+21x^2y^3$

9.) $5y(6y^3-4y^2-8y+1)-6y^2(5y^2-4y+6) =$
$= 30y^4-20y^3-40y^2+5y-30y^4+24y^3-36y^2 =$
$= 4y^3-76y^2+5y$

10.) $3ab(1-5b+b^2)-bx(2ab-3b) =$
$= 3ab-15ab^2+3ab^3-2ab^2x+3b^2x$

11.) $[(4x^2-5xy-y^2)3xy-(15x^3y-7x^2y^2+2xy^3)](-3xy^3) =$
$= [12x^3y-15x^2y^2-3xy^3-15x^3y+7x^2y^2-2xy^3](-3xy^3) =$
$= [-3x^3y-8x^2y^2-5xy^3](-3xy^3) =$
$= 9x^4y^4+24x^3y^5+15x^2y^6$

12.) $(6a+7b+8c)(3x+4y) =$
$= 18ax+21bx+24cx+24ay+28by+32cy$

13.)
$$\begin{array}{r} (a^3-5a^2+6)(4a-7) \\ \hline 4a^4-20a^3+24a \\ \quad -7a^3+35a^2-42 \\ \hline 4a^4-27a^3+35a^2+24a-42 \end{array}$$

14.)
$$\begin{array}{r} (9x^2-24x+16)(3x-4) \\ \hline 27x^3-72x^2+48x \\ \quad -36x^2+96x-64 \\ \hline 27x^3-108x^2+144x-64 \end{array}$$

15.)
$$\begin{array}{r} (x^7+x^5+x^3+x)(x^2-1) \\ \hline x^9+x^7+x^5+x^3 \\ \quad -x^7-x^5-x^3-x \\ \hline x^9 \qquad\qquad -x \end{array}$$

16.)
$$\begin{array}{r} (x^4+x^3+x^2+x+1)(x-1) \\ \hline x^5+x^4+x^3+x^2+x \\ \quad -x^4-x^3-x^2-x-1 \\ \hline x^5 \qquad\qquad -1 \end{array}$$

17.)
$$\begin{array}{r} (a^4+a^3b+a^2b^2+ab^3+b^4)(a-b) \\ \hline a^5+a^4b+a^3b^2+a^2b^2+ab^4 \\ \quad -a^4b-a^3b^2-a^2b^2-ab^4-b^5 \\ \hline a^5 \qquad\qquad\qquad -b^5 \end{array}$$

18.)
$$\begin{array}{r} (x-y-z)(x+y-z) \\ \hline x^2-xy-xz \\ \quad +xy \qquad -y^2-yz \\ \qquad -xz \qquad +yz+z^2 \\ \hline x^2 \qquad -2xz-y^2 \qquad +z^2 \end{array}$$

19.)
$$\begin{array}{r} (4x+7y-5)(3x-5y-6) \\ \hline 12x^2+21xy-15x \\ \quad -20xy \qquad -35y^2+25y \\ \qquad -24x \qquad -42y+30 \\ \hline 12x^2+xy-39x-35y^2-17y+30 \end{array}$$

20.)
$$\begin{array}{r} (1-2x+3x^2)(3-2x+4x^2) \\ \hline 3-6x+9x^2 \\ \quad -2x+4x^2-6x^3 \\ \qquad +4x^2-8x^3+12x^4 \\ \hline 3-8x+17x^2-14x^3+12x^4 \end{array}$$

21.) $(3x^2-4x-5)(2x^2-3x+4)$

$6x^4-8x^3-10x^2$

$-9x^3+12x^2+15x$

$+12x^2-16x-20$

$6x^4-17x^3+14x^2-x-20$

22.) $(6x^3+5x^2y-5xy^2-y^3)(3x^2-xy+3y^2)$

$18x^5+15x^4y-15x^3y^2-3x^2y^3$

$-6x^4y-5x^3y^2+5x^2y^3+xy^4$

$+18x^3y^2+15x^2y^3-15xy^4-3y^5$

$18x^5+9x^4y-2x^3y^2+17x^2y^3-14xy^4-3y^5$

23.) $(x+3)(x-4)(x-5)=(x^2-x-12)(x-5)=$

$=x^3-6x^2-7x+60$

$(x+3)(x-4)$

x^2+3x

$-4x-12$

x^2-x-12

$(x^2-x-12)(x-5)$

x^3-x^2-12x

$-5x^2+5x+60$

$x^3-6x^2-7x+60$

24.) $(x-3)(x+3)(x^2+9)=(x^2-9)(x^2+9)=x^4-81$

U knjizi fali prednja zagrada.

25.) $x^4-(x+8)(x-8)(x^2+64)=$

$=x^4-(x^2-64)(x^2+64)=x^4-(x^4-64^2)=$

$=x^4-x^4+4096=4096$

---

§ 57. Dijeljenje monoma.

1.) $3a:3=a$ 2.) $5a:a=5$ 3.) $6x:3=2x$

4.) $15ab:5a=3b$ 5.) $24mx:4x=6m$

6.) $36mn:9m=4n$ 7.) $3abc:ac=3b$

8.) $4ax:2ax=2$ 9.) $abx:3ay=\frac{bx}{3y}$

10.) $8x^2y:2x^2=4y$ 11.) $21a^5:3a^2=7a^3$

12.) $6a^4:2a^2=3a^2$ 13.) $9x^4y^3:3x^3y=3xy^2$

14.) $7a^2m^5:4a^2m=\frac{7}{4}m^4$

15.) $18(x+y)^3:9(x+y)=2(x+y)^2$

16.) $(a-5b)^8:(a-5b)^5=(a-5b)^3$

17.) $(a+b)^2:(a+b)=a+b$

18.) $(a-b)^2:(a-b)=a-b$

19.) $(a^2-b^2):(a+b)=a-b$ Vidi § 55

20.) $(a^2-b^2):(a-b)=a+b$ Vježbe II. Zad. 21.

1.) $(+28):(-4)=-7$ 2.) $(-32):(-8)=4$

3.) $(-18):9=2$ 4.) $(-4)(+8):(-16)=(-32):(-16)=2$

5.) $(-4)(-8):(-16)=(+32):(-16)=-2$

6.) $(-6am):2m=-3a$

7.) $(-28xy):(-7x)=4y$

8.) $24xy:(-6x)=-4y$

9.) $-64ab^4m:8ab^2=-8b^2m$

10.) $7axy:-5amy=-\frac{7}{5}\cdot\frac{x}{m}$

11.) $3a^4b:-bxy=-\frac{3a^4}{xy}$

12.) $-xy:5ax=-\frac{y}{5a}$

13.) $[27a^7b^4x^6:(-3a^3x^2)]:3a^4b^2x^2=$

$=[-9a^4b^4x^4]:3a^4b^2x^2=-3b^2x^2$

---

§ 58. Dijeljenje polinoma.

I.

1.) $(16+40):8=2+5=7$

2.) $(21-12):3=7-4=3$

3.) $(42+30-48):6=7+5-8=4$

4.) $(ax-bx):x = a-b$

5.) $(a^2+a):a = a+1$

6.) $(x^2-x):x = x-1$

7.) $(ax+bx):(-x) = -a-b$

8.) $(-4x+8y):(-4) = x-2y$

9.) $(4a^2+6ab):2a = 2a+3b$

10.) $(9a^2bc-6b^2c^2):3bc = 3a^2-2bc$

11.) $(35x^2y^4-21x^4y^2):(-7x^2y^2) = -5y^2+3x^2$

12.) $[(30a^2bx^2y-20ab^2xy^2):(-5ab)]:(-2xy) =$
$= [-6ax^2y+4bxy^2]:(-2xy) = 3ax-2by$

13.) $(5\frac{1}{2}m^3n^3-6\frac{3}{5}m^4n^2):11m^3n^3 =$
$= (\frac{11}{2}m^3n^3-\frac{33}{5}m^4n^2):11m^3n^3 =$
$= \frac{1}{2}-\frac{3m}{5n}$

14.) $[7a^4-21a^3b(x-y)-7a^4b^3]:(-7a^4) =$
$= a^3-3ab(x-y)-b^3$

15.) $[5x^3y(5x-4y)+5xy^3(3x-2y)]:5xy =$
$= x^2(5x-4y)+y^2(3x-2y) = 5x^3-4x^2y+3xy^2-2y^3$

16.) $3ab+2a = a(3b+2)$

17.) $5x^2y-6xz = x(5xy-6z)$

18.) $3a^2b+6ab^2 = 3ab(a+b)$

19.) $12m^5n^2+8m^4n^3+4m^3n^4 =$
$= 4m^3n^2(3m^2+2mn+n^2)$

20.) $(a+b)c+(a+b)d = (a+b)(c+d)$

21.) $5x(3x-4y)-2y(3x-4y) = (3x-4y)(5x-2y)$

22.) $3x(2x^2+5y^2)-4y(2x^2+5y^2) = (2x^2+5y^2)(3x-4y)$

23.) $5a^3x^2-2a^2x^4+5ab^2y^2-2b^2x^2y^2 =$
$= a^2x^2(5a-2x^2)+b^2y^2(5a-2x^2) =$
$= (5a-2x^2)(a^2x^2+b^2y^2)$

24.) $6a^3xy+6a^3mn-6b^3xy-6b^3mn =$
$6a^3(xy+mn)-6b^3(xy+mn) =$
$= (xy+mn)(6a^3-6b^3) = 6(xy+mn)(a^3-b^3)$

25.) $24x^4y^3-15mnx^2y^2-16mnx^2y+10m^2n^2 =$
$= 3x^2y^2(8x^2y-5mn)-2mn(8x^2y-5mn) =$
$= (8x^2y-5mn)(3x^2y^2-2mn)$

Dijeljenje polinoma.

II.

1.) $(15a+5b):(3a+b) = 5$
$-15a+5b$
0

2.) $(a^2+2ab):(a+2b) = a$
$-a^2+2ab$
0

Primjedba: mnogi od ovih zadataka mnogu se pojednostaviti, da se najprije izvodi zajednički faktor iz djeljenika, a onda istom izvede dijeljenje. N.p. 1.) $5(3a+b):2.)$ $a(a+2b)$ i t.d.

3.) $(ax^2-ay^2):(x^2-y^2) = a$
$-ax^2-ay^2$
0

4.) $(ac+bc+ad+bd):(a+b) = c+d$
$-ac+bc$
$+ad+bd$
$+ad+bd$
0

5.) $(mr+ms+nr+ns):(m+n) = r+s$
$-mr+nr$
$+ms+ns$
$+ms+ns$
0

6.) $(ax-by+ay-bx):(x+y) = a-b$
$-ax+ay$
$-by-bx$
$-by-bx$
0

7.) $(6mx-9nx+4my-6ny):(2m-3n)=3x+2$

$6mx-8nx$

$+4my-6ny$

$+4my-6ny$

0

8.) $(4a^2+16ab+16b^2):(2a+4b)=2a+4b$

$4a^2+8ab$

$+8ab+16b^2$

$+8ab+16b^2$

0

9.) $(35x^2-27xy-18y^2):(5x-6y)=7x+3y$

$35x^2-42xy$

$+15xy-18y^2$

$+15xy-18y^2$

0

10.) $(10x^3+17x^2+23x+4):(5x+1)=2x^2+3x+4$

$10x^3+2x^2$

$+15x^2+23x$

$+15x^2+3x$

$+20x+4$

$+20x+4$

0

11.) $(x^4+10x^3+35x^2+50x+24):(x+4)=x^3+6x^2+11x+6$

x^4+4x^3

$+6x^3+35x^2$

$+6x^3+24x^2$

$+11x^2+50x$

$+11x^2+44x$

$+6x+24$

$+6x+24$

0

12.) $(4a^3+4a^2-29a+21):(2a-3)=2a^2+5a-7$

$4a^3-6a^2$

$+10a^2-29a$

$+10a^2-15a$

$-14a+21$

$-14a+21$

0

13.) $(42a^4-23a^2x^2-5x^4):(7a^2-5x^2)=6a^2+x^2$

$42a^4-30a^2x^2$

$+7a^2x^2-5x^4$

$+7a^2x^2-5x^4$

0

14.) $(36x^2y^2+37xy-10):(4xy+5)=9xy-2$

$36x^2y^2+45xy$

$-8xy-10$

$-8xy-10$

0

15.) $(104x^4+88ax^2-19):(13x^2-2a)=8x^2+8a$

$104x^4-16ax^2$

$+104ax^2-19$

$+104ax^2-16a^2$

$+16a^2-19$ Ostatak

16.) $(3-11m+16m^2-19m^3+14m^4):(1-2m)=3-5m+6m^2-7m^3$

$3-6m$

$-5m+16m^2$

$-5m+10m^2$

$+6m^2-19m^3$

$+6m^2-12m^3$

$-7m^3+14m^4$

$-7m^3+14m^4$

0

17.) $(4-3a+6a^2+6a^3-3a^4+4a^5):(1+a)=4-7a+13a^2-7a^3+4a^4$

$\pm 4 \pm 4a$

$-7a+6a^2$

$-7a-7a^2$

$+13a^3+6a^3$

$+13a^3+13a^3$

$-7a^3-3a^4$

$-7a^3-7a^4$

$+4a^4+4a^5$

$+4a^4+4a^5$

0

18.) $(9x^2-49):(3x+7)=3x-7$. Różnica kwadratów!

19.) $(15x^3+4x^2y-29xy^2+10y^3):(3x+5y)=5x^2-7xy+2y^2$

$+15x^3+25x^2y$

$-21x^2y-29xy^2$

$-21x^2y-35xy^2$

$+6xy^2+10y^3$

$+6xy^2+10y^3$

0

20.) $(x^8-1):(x^2+1)=x^6-x^4+x^2-1$

x^8+x^6

$-x^6-1$

$-x^6-x^4$

$+x^4-1$

$+x^4+x^2$

$-x^2-1$

$-x^2-1$

0

21.) $(y^5-1):(y-1)=y^4+y^3+y^2+y+1$

$-y^5+y^4$

$+y^4-1$

$+y^4-y^3$

$+y^3-1$

$+y^3-y^2$

$+y^2-1$

$+y^2-y$

$+y-1$

$+y-1$

0

22.) $(x^6+y^6):(x-y)=x^5+x^4y+x^3y^2+x^2y^3+xy^4+y^5$

$-x^6-x^5y$

$+x^5y+y^6$

$+x^5y-x^4y^2$

$+x^4y^2+y^6$

$+x^4y^2-x^3y^3$

$+x^3y^3+y^6$

$+x^3y^3-x^2y^4$

$+x^2y^4+y^6$

$+x^2y^4-xy^5$

$+xy^5+y^6$

$+xy^5-y^6$

$+2y^6$ Reszta.

23.) $(48x^2-12y^2-118x+5y+72):(8x-4y-9)=6x+3y-8$

$-48x^2+24xy+54x$

$+24xy-64x-12y^2+5y$

$+24xy+12y^2+27y$

$-64x+32y+72$

$-64x+32y+72$

0

24.) $(15+8x-32x^2+32x^3-15x^4):(3+4x-5x^2)=5-4x+3x^2$

$+15+20x-25x^2$

$-12x-7x^2+32x^3$

$-12x-16x^2+20x^3$

$+9x^2+12x^3-15x^4$

$+9x^2+12x^3-15x^4$

0

25.) $(3a^4-11a^3+29a^2-27a+30):(3a^2-2a+5)=a^2-3a+6$

$+3a^4-2a^3+5a^2$

$-9a^3+24a^2-27a$

$-9a^3+6a^2-15a$

$+18a^2-12a+30$

$+18a^2-12a+30$

0

26.) $(8m^6+27):(4m^4-6m^2+9)=2m^2+3$

$+8m^6-12m^4+18m^2$

$+12m^4-18m^2+27$

$+12m^4-18m^2+27$

0

27.) $(a^6+6a^2-5a^4-1):(2a^2-a^2+1-a^3)=$

$(a^6-5a^4+6a^2-1):(-a^3-a^2+2a+1)=-a^3+a^2+2a-1$

$+a^6+a^5-2a^4-a^3$

$-a^5-3a^4+a^3+6a^2$

$-a^5-a^4+2a^3+a^2$

$-2a^4-a^3+5a^2-1$

$-2a^4-2a^3+4a^2+2a$

$+a^3+a^2-2a-1$

$+a^3+a^2-2a-1$

0

28.) $(15x^4+8x^3y-41x^2y^2+10xy^3+8y^4):(5x^2+6xy-8y^2)=$

$=3x^2-2xy-y^2$

$+15x^4+18x^3y-24x^2y^2$

$-10x^3y-17x^2y^2+10xy^3$

$-10x^3y-12x^2y^2+16xy^3$

$-5x^2y^2-6xy^3+8y^4$

$-5x^2y^2-6xy^3+8y^4$

0

29.) $3ab:(1-ab)=$

$3ab:(-ab+1)=-3$

$-3ab-3$

$+3$ Ostatak

30.) $1:(1+2x+x^2)=1-2x+3x^2-4x^3$ i.d.

$+1+2x+x^2$

$-2x-x^2$

$-2x-4x^2-2x^3$

$+3x^2+2x^3$

$+3x^2+6x^3+3x^4$

$-4x^3-3x^4$

$-4x^3-8x^4-4x^5$

$+5x^4+4x^5$

31.) $4ab:(1-2a)=$

$4ab:(-2a+1)=-2b-\frac{b}{a}$ i.d.

$+4ab-2b$

$+2b$

$+2b-\frac{b}{a}$

$+\frac{b}{a}$

32.) $(16x^6+7x^4-2x^2-1):(4x^3-3x^2+2x-1)=$

$16x^6-12x^5+8x^4-4x^3 \quad = 4x^3+3x^2+2x+1$

$+12x^5-x^4+4x^3-2x^2$

$+12x^5-9x^4+6x^3-3x^2$

$+8x^4-2x^3+x^2-1$

$+8x^4-6x^3+4x^2-2x$

$+4x^3-3x^2+2x-1$

$+4x^3-3x^2+2x-1$

0

33.) $(1-a^{10}):(1+a-a^5-a^6)=1-a+a^2-a^3+a^4$

$1+a-a^5-a^6$

$-a+a^5+a^6-a^{10}$

$-a-a^2+a^6+a^7$

$+a^2+a^5-a^7-a^{10}$

$+a^2+a^3-a^7-a^8$

$-a^3+a^5+a^8-a^{10}$

$-a^3-a^4+a^8+a^9$

$+a^4+a^5-a^9-a^{10}$

$+a^4+a^5-a^9-a^{10}$

0

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§59. Računanje sa razlomcima. Rastvaranje općih brojeva na faktore.

Vježbe I.

1.) $x^2+4xy+3y^2=$
$=x^2+xy+3xy+3y^2=$
$=x(x+y)+3y(x+y)=$
$=(x+y)(x+3y)$

2.) $x^2+6xy+5y^2=$
$=x^2+xy+5xy+5y^2=$
$=x(x+y)+5y(x+y)=$
$=(x+y)(x+5y$

Primjedba za zad 2.) U knjizi je tiskarska pogrješka. Srednji član treba da glasi $6xy$ mjesto $6x$.

3.) $a^2-4ab+3b^2=$
$=a^2-ab-3ab+3b^2=$
$=a(a-b)-3b(a-b)=$
$=(a-b)(a-3b)$

4.) $m^2-8mn+7n^2=$
$=m^2-mn-7mn+7n^2=$
$=m(m-n)-7n(m-n)=$
$=(m-n)(m-7n)$

5.) $x^2+6x+5=$
$=x^2+x+5x+5=$
$=x(x+1)+5(x+1)=$
$=(x+1)(x+5)$

6.) $x^2-6x+5=$
$=x^2-x-5x+5=$
$=x(x-1)-5(x-1)=$
$=(x-1)(x-5)$

7.) $x^2-13x+12=$
$=x^2-x-12x+12=$
$=x(x-1)-12(x-1)=$
$=(x-1)(x-12)$

8.) $x^2+11x+24=$
$=x^2+3x+8x+24=$
$=x(x+3)+8(x+3)=$
$=(x+3)(x+8)$

9.) $(x^2-14x+13=$
$=x^2-x-13x+13=$
$=x(x-1)-13(x-1)=$
$=(x-1)(x-13)$

10.) $x^2+7x+10=$
$=x^2+2x+5x+10=$
$=x(x+2)+5(x+2)=$
$=(x+2)(x+5)$

11.) $x^2+11x+10=$
$=x^2+x+10x+10=$
$=x(x+1)+10(x+1)=$
$=(x+1)(x+10)$

12.) $x^2+9x+14=$
$=x^2+2x+7x+14=$
$=x(x+2)+7(x+2)=$
$=(x+2)(x+7)$

13.) $x^2-9x+18=$
$=x^2-3x-6x+18=$
$=x(x-3)-6(x-3)=$
$=(x-3)(x-6)$

14.) $x^2-9x+20=$
$=x^2-4x-5x+20=$
$=x(x-4)-5(x-4)=$
$=(x-4)(x-5)$

15.) $x^2-12x+27=$
$=x^2-3x-9x+27=$
$=x(x-3)-9(x-3)=$
$=(x-3)(x-9)$

16.) $6a^2+5ab+b^2=$
$=6a^2+2ab+3ab+b^2=$
$=2a(3a+b)+b(3a+b)=$
$=(3a+b)(2a+b)$

17.) $20a^2+13ab+2b^2=$
$=20a^2+8ab+5ab+2b^2=$
$=4a(5a+2b)+b(5a+2b)=$
$=(5a+2b)(4a+b)$

18.) $6a^2-17ab+10b^2=$
$=6a^2-12ab-5ab+10b^2=$
$=6a(a-2b)-5b(a-2b)=$
$=(a-2b)(6a-5b)$

19.) $x^2+4x-12=$
$=x^2+6x-2x-12=$
$=x(x+6)-2(x+6)=$
$=(x+6)(x-2)$

20.) $x^2-2x-8=$
$=x^2-4x+2x-8=$
$=x(x-4)+2(x-4)=$
$=(x-4)(x+2)$

21.) $x^2+5x-36=$
$=x^2+9x-4x-36=$
$=x(x+9)-4(x+9)=$
$=(x+9)(x-4)$

22.) $x^2-4x-5=$
$=x^2-5x+x-5=$
$=x(x-5)+(x-5)=$
$=(x-5)(x+1)$

23.) $x^2-6x-16=$
$=x^2-8x+2x-16=$
$=x(x-8)+2(x-8)=$
$=(x-8)(x+2)$

24.) $x^2-3x-28=$
$=x^2-7x+4x-28=$
$=x(x-7)+4(x-7)=$
$=(x-7)(x+4)$

25.) $3a^2-2ab-8b^2=$
$=3a^2-6ab+4ab-8b^2=$
$=3a(a-2b)+4b(a-2b)=$
$=(a-2b)(3a+4b)$

26.) $4a^2-17ab-15b^2=$
$=4a^2-20ab+3ab-15b^2=$
$=4a(a-5b)+3b(a-5b)=$
$=(a-5b)(4a+3b)$

27.) $10a^2+13ab-3b^2=$
$=10a^2+15ab-2ab-3b^2=$
$=5a(2a+3b)-b(2a+3b)=$
$=(2a+3b)(5a-b)$

Vježbe II.

Najveća zajednička mjera.

1.) $4ab^2=2\cdot2\cdot a\cdot b\cdot b$
$6a^2bc=2\cdot3\cdot a\cdot a\cdot b\cdot c$
$21abc=3\cdot7\cdot a\cdot b\cdot c$
} $n.z.m=a\cdot b=ab$

2.) $2x^2y^2=2\cdot x\cdot x\cdot y\cdot y$
$8x^4y^3z^3=2\cdot2\cdot2\cdot x\cdot x\cdot x\cdot x\cdot y\cdot y\cdot y\cdot z\cdot z\cdot z$
$12x^3y^5z^2=2\cdot2\cdot3\cdot x\cdot x\cdot x\cdot y\cdot y\cdot y\cdot y\cdot y\cdot z\cdot z$
} $n.z.m=2\cdot x\cdot x\cdot y=2x^2y$

3.) $49a^2-b^2=(7a+b)(7a-b)$
$14ab+2b^2=2b(7a+b)$
} $n.z.m.=7a+b$

4.) $4a^2+4ab=2\cdot2\cdot a(a+b)$
$5ab+5b^2=5\cdot b(a+b)$
$8a^2b+8ab^2=2\cdot2\cdot2\cdot a\cdot b(a+b)$
} $n.z.m.=a+b$

5.) $x^2-2xy+y^2=(x-y)(x-y)$
$3x-3y=3(x-y)$
} $n.z.m.=x-y$

6.) $x^2-6x+9=(x-3)(x-3)$
$x^2-3x=x(x-3)$
} $n.z.m.=x-3$

Vježbe III.

Najmanji zajednički višekratnik.

1.) $15a^3b=3\cdot5\cdot a\cdot a\cdot a\cdot b=$
$54a^2b^4=2\cdot3\cdot3\cdot3\cdot a\cdot a\cdot b\cdot b\cdot b\cdot b$
$N.z.mn.=2\cdot3\cdot3\cdot3\cdot5\cdot a\cdot a\cdot a\cdot b\cdot b\cdot b\cdot b=270a^3b^4$

2.) $7ax^2y^3=7\cdot a\cdot x\cdot x\cdot y\cdot y\cdot y$
$5a^2bxy=5\cdot a\cdot a\cdot b\cdot x\cdot y$
$2a^2b^2xy^2=2\cdot a\cdot a\cdot b\cdot b\cdot x\cdot y\cdot y$
}
$N.z.mn=2\cdot5\cdot7\cdot a\cdot a\cdot b\cdot b\cdot x\cdot x\cdot y\cdot y\cdot y=70a^2b^2x^2y^3$

3.) $18mn^5x^3y^2 = 2.3.3.m.n.n.n.n.x.x.x.y.y$
$45m^3n^2x^2y^4 = 3.3.5.m.m.m.n.n.x.x.y.y.y.y$
$63m^2n^3x^5y^3 = 3.3.7.m.m.n.n.n.x.x.x.x.x.y.y.y$
N.z. $mn = 2.3.3.5.7.m.m.m.n.n.n.n.n.x.x.x.y.y.y.y =$
$= 630m^3n^5x^3y^4$

4.) $3(a-b) = 3.(a-b)$
$a^2-ab = a(a-b)$
N.z. $mn = 3a(a-b)$

5.) N.z. mn je a^2-b^2, jer je $(a+b)$ u a^2-b^2 $(a-b)$ puta sadržano.

6.) $2ax+4bx = 2x(a+2b)$
$6a^2b+12ab^2 = 2.3.a.b(a+2b)$
N.z. $mn. = 2.3.a.b.x(a+2b) = 6abx(a+2b)$

7.) $4a^2+4ab = 2.2.a(a+b)$
$5ab+5b^2 = 5.b.(a+b)$
$8a^2b+8ab^2 = 2.2.2.a.b(a+b)$
N.z. $mn = 2.2.2.5.a.b(a+b) = 40ab(a+b)$

8.) $a^2+3a-10 = (a+5)(a-2)$
$a^2+8a+15) = (a+5)(a+3)$
N.z. $mn = (a+5)(a+3)(a-2)$

9.) $x^2+3xy+2y^2 = (x+y)(x+2y)$
$6x^2+15xy+9y^2 = 3(x+y)(2x+3y)$
N.z. $mn = 3(x+y)(x+2y)(2x+3y)$

10.) $3x+4y = 3x+4y$
$6x^2-xy-12y^2 = (3x+4y)(2x-3y)$
$3x^2+16xy+16y^2 = (3x+4y)(x+4y)$
N.z. $mn = (3x+4y)(2x-3y)(x+4y)$

Vježbe IV.

Svojstva razlomaka.

1.) $\frac{24ab}{16bc} = \frac{3a}{2c}$ /8b 2.) $\frac{35xy}{14ab} = \frac{5xy}{2ab}$ /7

3.) $\frac{12ay^2}{30by} = \frac{2ay}{5b}$ /6y 4.) $\frac{33m^3n^2}{36m^2n^4} = \frac{11m}{12n^4}$ /3m²n²

5.) $\frac{45a^3b^2c}{54ab^2c^3} = \frac{5a^2}{6c^2}$ /9ab²c 6.) $\frac{a^2-b^2}{(a+b)^2} = \frac{a-b}{a+b}$ /(a+b)

7.) $\frac{(x-y)^2}{x^2-y^2} = \frac{x-y}{x+y}$ /(x-y) 8.) $\frac{(m+n)^2}{m^2-n^2} = \frac{m+n}{m-n}$ /(m+n)

9.) $\frac{a^2+ab}{b^2+ab} = \frac{a(a+b)}{b(a+b)} = \frac{a}{b}$

10.) $\frac{a^2-1}{a^3-a} = \frac{a^2-1}{a(a^2-1)} = \frac{1}{a}$

11.) Tiskarska pogrješka.

12.) $\frac{a^2-b^2}{a^2+2ab+b^2} = \frac{(a+b)(a-b)}{(a+b)(a+b)} = \frac{a-b}{a+b}$

13.) $\frac{x^2-1}{x^2-2x-3} = \frac{(x+1)(x-1)}{(x+1)(x-3)} = \frac{x-1}{x-3}$

14.) $\frac{x^2+4x+4}{x^2+5x+6} = \frac{(x+2)(x+2)}{(x+2)(x+3)} = \frac{x+2}{x+3}$

15.) $\frac{x^2-3x-10}{x^2+10x+16} = \frac{(x-5)(x+2)}{(x+2)(x+8)} = \frac{x-5}{x+8}$

U knjizi tiskarska pogrješka. Stoji x^3 mjesto x^2.

16.) $\frac{x^2-8x+15}{x^2-10x+21} = \frac{(x-5)(x-3)}{(x-7)(x-3)} = \frac{x-5}{x-7}$

17.) $\frac{a^2-5ab+6b^2}{3a^2-5ab-12b^2} = \frac{(a-3b)(a-2b)}{(a-3b)(3a+4b)} = \frac{a-2b}{3a+4b}$

18.) $\frac{24x^2-12x}{36x^2-36x+9} = \frac{12x(2x-1)}{9(4x^2-4x+1)} = \frac{12x(2x-1)}{9(2x-1)^2} = \frac{4x}{3(2x-1)}$

19.) $a = \frac{5a}{5} = \frac{3a^2}{3a} = \frac{ax}{x} = \frac{ay^2}{y^2} = \frac{a(x+y)}{x+y}$
$5b = \frac{25b}{5} = \frac{15ab}{3a} = \frac{5bx}{x} = \frac{5by^2}{y^2} = \frac{5b(x+y)}{x+y}$
$2mn = \frac{10mn}{5} = \frac{6amn}{3a} = \frac{2mnx}{x} = \frac{2mny^2}{y^2} = \frac{2mn(x+y)}{x+y}$

$x+y = \frac{5(x+y)}{5} = \frac{3a(x+y)}{3a} = \frac{x(x+y)}{x+y} = \frac{y^2(x+y)}{x+y} = \frac{(x+y)^2}{x+y}$

20.) $\frac{m}{2m} = \frac{6m}{12n} = \frac{3mn}{6n^2} = \frac{12mxy}{24nxy}$

21.) a.) $\frac{a}{2} = \frac{a^2}{2a}$ $\quad \frac{b}{a} = \frac{2b}{2a}$ $\quad$ b.) $\frac{3}{2a} = \frac{15}{10a}$ $\quad \frac{2}{5a} = \frac{4}{10a}$ $\quad$ c.) $\frac{a}{5b} = \frac{3a^2}{15ab}$ $\quad \frac{b}{3a} = \frac{5b^2}{15ab}$

d.) $\frac{5x}{7bc} = \frac{15dx}{21bcd}$ $\quad \frac{2y}{3cd} = \frac{14by}{21bcd}$ $\quad$ e.) $\frac{x}{x+y} = \frac{x(x-y)}{x^2-y^2}$ $\quad \frac{x}{x-y} = \frac{x(x+y)}{x^2-y^2}$

f.) $\frac{x+2}{x^2-5x+6} = \frac{x+2}{(x-2)(x-3)} = \frac{(x+2)(x-1)}{(x-1)(x-2)(x-3)}$

$\frac{x-2}{x^2-4x+3} = \frac{x-2}{(x-1)(x-3)} = \frac{(x-2)^2}{(x-1)(x-2)(x-3)}$

g.) $\frac{x-1}{x+1} = \frac{(x-1)^2}{x^2-1}$ $\quad \frac{x+1}{x-1} = \frac{(x+1)^2}{x^2-1}$

h.) U knjizi fali drugi razlomak

i.) $\frac{n}{2a-2b} = \frac{2n(a+b)}{4(a^2-b^2)}$

$\frac{p}{4(a^2-b^2)} = \frac{p}{4(a^2-b^2)}$

k.) $\frac{x+5}{x^2+x-2} = \frac{x+5}{(x-1)(x+2)} = \frac{(x+5)(x-2)}{(x-1)(x+2)(x-2)}$

$\frac{x+4}{x^2-4} = \frac{x+4}{(x-2)(x+2)} = \frac{(x+4)(x-1)}{(x-1)(x+2)(x-2)}$

$\frac{x+2}{x^3-x^2-4x+4} = \frac{x+2}{(x^2-4)(x-1)} = \frac{x+2}{(x-1)(x+2)(x-2)}$

l.) $\frac{3a-b}{3z^2} = \frac{4(z^2-y^2)(3a-b)}{12z^2(z^2-y^2)}$

$\frac{a}{2z} = \frac{6z(z^2-y^2)\cdot a}{12z^2(z^2-y^2)}$

$\frac{5}{4(z^2-y^2)} = \frac{15z^2}{12z^2(z^2-y^2)}$

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§ 60. Zbrajanje i oduzimanje razlomaka.

1.) $\frac{3}{a} + \frac{4}{a} = \frac{7}{a}$ $\quad$ 2.) $\frac{a}{m} + \frac{b}{m} + \frac{5}{m} = \frac{a+b+5}{m}$

3.) $\frac{a}{x} + \frac{m+n}{x} = \frac{a+m+n}{x}$

4.) $\frac{a}{c} - \frac{1}{c} = \frac{a-1}{c}$

5.) $\frac{8a}{3x} - \frac{2a}{3x} + \frac{1}{3x} = \frac{8a-2a+1}{3x} = \frac{6a+1}{3x}$

6.) $\frac{5a}{xy} - \frac{8b-7a}{xy} = \frac{5a-8b+7a}{xy} = \frac{12a-8b}{xy}$

7.) $\frac{5x}{x-1} - \frac{1+2x}{x-1} = \frac{5x-1-2x}{x-1} = \frac{3x-1}{x-1}$

8.) $\frac{2m+2n}{4} - \frac{2m-3n}{4} = \frac{2m+2n-2m+3n}{4} = \frac{5n}{4}$

9.) $\frac{8x-9x}{3m} + \frac{2(2x+3y)}{3m} + \frac{3(3x-2y)}{3m} =$

$= \frac{8x-9x+4x+6y+9x-6y}{3m} = \frac{12x}{3m} = \frac{4x}{m}$

10.) $\frac{m-a}{m+n+p} + \frac{n-p}{m+n+p} + \frac{2p+a}{m+n+p} =$

$= \frac{m-a+n-p+2p+a}{m+n+p} = \frac{m+n+p}{m+n+p} = 1$

1.) $\frac{2a+b}{3} + \frac{5a+2b}{4} = \frac{4(2a+b)+3(5a+2b)}{12} =$

$= \frac{8a+4b+15a+6b}{12} = \frac{23a+10b}{12}$

2.) $\frac{x}{2m} + \frac{2x}{3m} + \frac{7x}{8m} = \frac{12x+16x+21x}{24m} = \frac{49x}{24m}$

3.) $\frac{a+b}{7} - \frac{a-b}{8} = \frac{8(a+b)-7(a-b)}{56} =$

$= \frac{8a+8b-7a+7b}{56} = \frac{a+15b}{56}$

4.) $\frac{m+n}{26} + \frac{m-n}{39} = \frac{3(m+n)+2(m-n)}{78} =$

$= \frac{3m+3n+2m-2n}{78} = \frac{5m+n}{78}$

5.) $\frac{x+y}{26m} - \frac{x-y}{39n} = \frac{3n(x+y)-2m(x-y)}{78mn} =$

$= \frac{3nx+3ny-2mx+2my}{78mn}$

6.) $\frac{1}{a} + \frac{2}{a-2} = \frac{a-2+2a}{a(a-2)} = \frac{3a-2}{a(a-2)}$

7.) $\frac{3}{x-3} - \frac{5}{x} = \frac{3x-5(x-3)}{x(x-3)} = \frac{3x-5x+15}{x(x-3)} = \frac{-2x+15}{x(x-3)}$

8.) $\frac{x}{x+2} + \frac{x}{x-2} = \frac{x(x-2)+x(x+2)}{x^2-4} = \frac{x^2-2x+x^2+2x}{x^2-4} = \frac{2x^2}{x^2-4}$

9.) $\frac{1}{a-b}+\frac{1}{a+b}=\frac{a+b+a-b}{a^2-b^2}=\frac{2a}{a^2-b^2}$

10.) $\frac{1}{m+n}+\frac{2n}{m^2-n^2}=\frac{m-n+2n}{m^2-n^2}=\frac{m+n}{m^2-n^2}=\frac{1}{m-n}$

11.) $\frac{y}{2y-2x}-\frac{x}{2x-2y}=\frac{y}{2y-2x}+\frac{x}{2y-2x}=\frac{x+y}{2y-2x}$

Primjedba: $2x-2y=-(2y-2x)$. Zadatak se zato može ovako napisati: $\frac{y}{2y-2x}-\left(-\frac{x}{2y-x}\right)$

12.) $\frac{2}{a}-\frac{3}{2a^2}+\frac{5}{a^3}+\frac{7}{4a^4}=\frac{8a^3-6a^2+20a+7}{4a^4}$

13.) $\frac{12x+4}{x^2-4}-\frac{2x+1}{x-2}=\frac{12x+4-(2x+1)(x+2)}{x^2-4}=$

$=\frac{12x+4-(2x^2+5x+2)}{x^2-4}=\frac{12x+4-2x^2-5x-2}{x^2-4}=\frac{7x-2x^2-6}{x^2-4}$

14.) $\frac{1}{x-y}+\frac{1}{x+y}-\frac{1}{x^2-y^2}=\frac{x+y+x-y-1}{x^2-y^2}=\frac{2x-1}{x^2-y^2}$

15.) $\frac{1}{x-1}+\frac{2}{(x-1)^2}+\frac{3}{(x-1)^3}=\frac{(x-1)^2+2(x-1)+3}{(x-1)^3}=$

$=\frac{x^2-2x+1+2x-2+3}{(x-1)^3}=\frac{x^2+2}{(x-1)^3}$

16.) $\frac{4}{x+1}\ \ \frac{3}{x-1}+\frac{1}{x+2}-\frac{2}{x-2}=$

$=\frac{4(x-1)(x^2-4)-3(x+1)(x^2-4)+(x-2)(x^2-1)-2(x+2)(x^2-1)}{(x^2-1)(x^2-4)}=$

$=\frac{(x^2-4)(4x-4-3x-3)+(x^2-1)(x-2-2x-4)}{(x^2-1)(x^2-4)}$

$=\frac{(x^2-4)(x-7)+(x^2-1)(-x-6)}{(x^2-1)(x^2-4)}=\frac{x^3-4x-7x^2+28-x^3+x-6x^2+6}{(x^2-1)(x^2-4)}=$

$=\frac{-13x^2-3x+34}{(x^2-1)(x^2-4)}$

U knjizi je valjda pogrješka u prvom razlomku u predzaku drugog člana u nazivniku

17.) $3+\frac{a}{b}=\frac{3b+a}{b}$

2.) $m-\frac{m^2}{m}=\frac{mn-m^2}{n}=\frac{m(n-1)}{n}$

3.) $\frac{3x}{5y}-1=\frac{3x-5y}{5y}$

4.) $\frac{3mn}{8}+m=\frac{3mn+8m}{8}=\frac{m(3n+8)}{8}$

5.) $a-\frac{a+b}{2}=\frac{2a-a-b}{2}=\frac{a-b}{2}$

6.) $a-\frac{a-b}{2}=\frac{2a-a+b}{2}=\frac{a+b}{2}$

7.) $\frac{(x-y)^2}{4x}+y=\frac{x^2-2xy+y^2+4xy}{4x}=\frac{x^2+2xy+y^2}{4x}=$

$=\frac{(x+y)^2}{4x}$

8.) $\frac{(x+y)^2}{4xy}-1=\frac{x^2+2xy+y^2-4xy}{4xy}=\frac{x^2-2xy+y^2}{4xy}=$

$=\frac{(x-y)^2}{4xy}$

9.) $m+1+\frac{1}{m+1}=\frac{(m+1)^2+1}{m+1}=\frac{m^2+2m+2}{m+1}$

10.) $(a+b)-\frac{2ab}{a+b}=\frac{(a+b)^2-2ab}{a+b}=\frac{a^2+2ab+b^2-2ab}{a+b}=$

$=\frac{a^2+b^2}{a+b}$.

11.) $\frac{x^2+y^2}{x-y}-(x+y)=\frac{x^2+y^2-(x^2-y^2)}{x-y}=\frac{x^2+y^2-x^2+y^2}{x-y}=$

$=\frac{2y^2}{x-y}$

12.) $1-\frac{a^2-b^2-c^2}{2bc}=\frac{2bc-a^2+b^2+c^2}{2bc}=\frac{(b+c)^2-a^2}{2bc}$

§. 61. Množenje razlomaka.

1.) $\frac{m}{3}\cdot 5=\frac{5m}{3}$ 2.) $\frac{2m}{3n}\cdot m=\frac{2m^2}{3n}$

3.) $\frac{x}{m}\cdot m=\frac{x}{1}=x$ 4.) $\frac{5a}{6b}\cdot 3b=\frac{5a}{2}$

5.) $\frac{7x}{9y}\cdot 3xy=\frac{7xz}{3}$ 6.) $\left(-\frac{3a}{2}\right)4ab=-12a^2$

7.) $\frac{5x}{8y}\cdot 4x^2y=\frac{5x^3}{2}$ 8.) $\frac{5a}{8b}\cdot 6a^2y=\frac{15a^3y}{4b}$

9.) $\frac{a-b}{mn}\cdot m=\frac{a-b}{n}$ 10.) $\frac{x+y}{ab}\cdot a^2b=a(x+y)$

11.) $\frac{m+n}{x^2y}\cdot x^2y^3=y^2(m+n)$

12.) $\frac{4x+3y}{30x^3} \cdot 10x^2 = \frac{4x+3y}{3x}$

13.) $-\frac{3ab}{4ca} \cdot (-8ac) = \frac{6a^2b}{a}$ 14.) $\frac{2}{1-m^2}(1+m) = \frac{2}{1-m}$

15.) $\left(2+\frac{3}{7a}\right)7a = 14a+3$

16.) $\left(\frac{3}{5m}-1\right)5m = 3-5m$

17.) $\left(\frac{x^2}{y^2}-\frac{2x}{y}+3\right)y^2 = x^2-2xy+3y^2$

18.) $\left(\frac{a^2}{b^2}-\frac{2a}{a}+1\right)ab = \frac{a^3}{a}-2a^2+ab$

19.) $\left(x-y+\frac{x^2+y^2}{x+y}\right)(x+y) = x^2-y^2+x^2+y^2 = 2x^2$

20.) $\left(\frac{3x}{4}-\frac{5}{6y}-\frac{3z}{x}\right)3xy = \frac{9x^2y}{4}-\frac{5x}{2}-24zy$

21.) $\frac{3xy+x^2}{x+y}(x^2-y^2) = (3xy+x^2)(x-y) =$

$= 3x^2y+x^3-3xy^2-x^2y = 2x^2y+x^3-3xy^2$

22.) $\frac{3(a+b)}{a-b}(a^2-b^2) = 3(a+b)^2$

23.) $\frac{3a^2}{8(x+2y)} \cdot 6(x+2y) = \frac{9a^2}{4}$

24.) $\frac{x-3}{x^2-2x+1}(3x-3) = \frac{x-3}{(x-1)^2}3(x-1) = \frac{3(x-3)}{x-1}$

1.) $3a \cdot \frac{7b}{6a} = \frac{7b}{2}$

2.) $3xy\,\frac{5x}{6y} = \frac{5x^2}{2}$ 3.) $2m\,\frac{ab}{c} = \frac{2abm}{c}$

4.) $8x^2\,\frac{15a}{12xy} = \frac{10ax}{3y}$

5.) $2(x+y)\frac{x-y}{x+y} = 2(x-y)$

6.) $5(a-b)\frac{a^2+b^2}{a^2-b^2} = \frac{5(a^2+b^2)}{a+b}$

7.) $3(x^2-y^2)\left(\frac{9x}{x-y}-\frac{3y}{x+y}\right) = 27x(x+y)-9y(x-y) =$

$= 27x^2+27xy-9xy+9y^2 = 27x^2-18xy+9y^2$

1.) $\frac{4a}{5b} \cdot \frac{3x}{5y} = \frac{12ax}{25by}$ 2.) $\frac{3m}{2n} \cdot \frac{3a}{3b} = \frac{9am}{6bn} = \frac{3am}{2bn}$

3.) $\frac{6x^3y}{m^3} \cdot \frac{9x^2y^3}{4m^2} = \frac{27x^5y^4}{2m^5}$

4.) $\left(-\frac{5x^3}{3y^3}\right)\frac{2y^2}{3x^2} = -\frac{10x}{9y}$

5.) $\frac{a}{a+b} \cdot \frac{x+y}{x} = \frac{a(x+y)}{x(a+b)}$

6.) $\frac{x-1}{x+1} \cdot \frac{x^2-1}{x} = \frac{(x-1)^2}{x}$

7.) $\frac{m+n}{m-n} \cdot \frac{m^2-n^2}{3} = \frac{(m+n)^2}{3}$

8.) $\frac{x^2-y^2}{y-x} \cdot \frac{x}{x+y} = \frac{(x^2-y^2)x}{[-(x-y)](x+y)} = \frac{(x^2-y^2)x}{-(x^2-y^2)} = -x$

9.) $\left(a+\frac{b}{x}\right)\left(a-\frac{b}{x}\right) = a^2-\frac{b^2}{x^2}$

10.) $\left(\frac{m}{n}+\frac{x}{y}\right)\left(\frac{m}{n}-\frac{x}{y}\right) = \frac{m^2}{n^2}-\frac{x^2}{y^2}$

11.) $\left(\frac{a+b}{a-b}+1\right)\left(\frac{a-b}{a+b}-1\right) = \frac{a+b+a-b}{a-b} \cdot \frac{a-b-a-b}{a+b} =$

$= \frac{2a}{a-b} \cdot \frac{-2b}{a+b} = -\frac{4ab}{a^2-b^2}$

12.) $\left(\frac{x}{2}+\frac{x}{3}-\frac{x}{4}\right)\left(\frac{5}{x}-\frac{6}{x}\right) = \frac{5}{2}+\frac{5}{3}-\frac{5}{4}-\frac{6}{2}-\frac{6}{3}+\frac{6}{4} =$

$= -\frac{1}{2}-\frac{1}{3}+\frac{1}{4} = -\frac{7}{12}$

13.) $\left(\frac{x^2-1}{x^2}-\frac{x-1}{x}+1\right)\left(\frac{x+1}{x}-2\right) =$

$= \frac{x^2-1-x^2+x+x}{x^2} \cdot \frac{x+1-2x}{x} = \frac{x^2+x-1}{x^2} \cdot \frac{1-x}{x} =$

$= \frac{-x^3+2x-1}{x^3}$

14.) $\left(\frac{1}{a+b}-\frac{2}{a-b}+\frac{3}{a^2-b^2}\right)\frac{(a+b)^2}{mn} =$

$= \frac{a-b-2(a+b)+3}{a^2-b^2} \cdot \frac{(a+b)^2}{mn} = \frac{a-b-2a-2b+3}{a-b} \cdot \frac{a+b}{mn} =$

$= \frac{(-a-3b+3)(a+b)}{mn(a-b)}$

15.) $\frac{a^2x}{by} \cdot \frac{mx^2}{ny} \cdot 5a^2b^3 = \frac{5a^4b^3mx^3}{bny^2} = \frac{5a^4b^2mx^3}{ny^2}$

16.) $\frac{x^2-1}{2x+3} \cdot \frac{2x+3}{x+1} \cdot \frac{3}{x-1} = \frac{(2x+3)(x-1)(x+1) \cdot 3}{(2x+3)(x-1)(x+1)} = 3$

17.) $\left(1+\frac{a}{b}\right)\left(1-\frac{a}{a}\right)\frac{a}{a+b} \cdot \frac{a}{-a+b} = \left(1-\frac{a^2}{b^2}\right)\frac{a}{a+b}\left(\frac{-a}{a-b}\right) =$

$= \frac{b^2-a^2}{b^2} \cdot \left(\frac{-ab}{a^2-b^2}\right) = \frac{ab(a^2-b^2)}{b^2(a^2-b^2)} = \frac{a}{b}$

18) $\left(\frac{3m}{m-1}-\frac{2m}{m+1}-\frac{m^2}{m^2-1}\right)\cdot\frac{m^2-1}{m}=$

$=\frac{3m(m+1)-2m(m-1)-m^2}{m^2-1}\cdot\frac{m^2-1}{m}=$

$=\frac{3m^2+3m-2m^2+2m-m^2}{m}=5$

19) $\left(\frac{a}{b}+\frac{a^3}{3b^2}+\frac{a^5}{5b^3}+\frac{a^7}{7b^4}\right)\left(\frac{b^5}{a^5}-\frac{3b^4}{a^3}+\frac{5b^3}{a}\right)=$

$=\frac{b^4}{a^4}+\frac{b^3}{3a^2}+\frac{b^2}{5}+\frac{a^2b}{7}-\frac{3b^3}{a^2}-b^2-\frac{3a^2b}{5}-\frac{3a^4}{7}+$

$+5b^2+\frac{5ba^2}{3}+a^4+\frac{5a^6}{7b}=$

$=\frac{105b^5+35a^2b^4+21a^4b^3+15a^6b^2-315a^2b^4-105a^4b^3-63a^6b^2-45a^8b+525a^4b^3+175a^6b^2+105a^8b+75a^{10}}{105a^4b}=$

$=\frac{105b^5-280a^2b^4+441a^4b^3+127a^6b^2+60a^8b+75a^{10}}{105a^4b}$

20) $\left(\frac{2x^3}{y^2}-\frac{3x^2}{y}+\frac{4x}{5}-5y\right)\left(\frac{x^2}{y}-\frac{2x}{3}+4y\right)=$

$=\frac{10x^3-15x^2y+4xy^2-25y^3}{5y^2}\cdot\frac{3x^2-2xy+12y^2}{3y}=$

$=\frac{30x^5-45x^4y+12x^3y^2-75x^2y^3-20x^4y+30x^3y^2-8x^2y^3+50xy^4+120x^3y^2-180x^2y^3+48xy^4-300y^5}{15y^3}=$

$=\frac{30x^5-65x^4y+162x^3y^2-263x^2y^3+98xy^4-300y^5}{15y^3}$

---

§ 62. Dijeljenje razlomaka.

1) $\frac{a^2}{b}:a=\frac{a}{b}$ 2) $\frac{xy}{m}:y=\frac{x}{m}$ 3) $\frac{4a}{5m}:2a=\frac{2}{5m}$

4) $\frac{ax}{5y}:3y=\frac{2x}{5y^2}$ 5) $\frac{a}{b}:b=\frac{a}{b^2}$

6) $\frac{a^2}{b^2}:ab=\frac{a}{b^3}$ 7) $\frac{7m^2}{2n^2}:3mn=\frac{7m}{6n^3}$

8) $\frac{5mx}{6ny}:(-3mx)=-\frac{5m}{18n^2y}$

9) $\frac{27(x^2-9)}{4xy}:9(x+y)=\frac{3(x-y)}{4xy}$

10) $(a+\frac{b}{c}):m=\frac{ac+b}{c}:m=\frac{ac+b}{mc}$

11) $\left(\frac{a}{b}-\frac{b}{y}\right):2xy=\frac{ay-b^2}{by}:2xy=\frac{ay-b^2}{2bxy^2}$

12) $\left(x-\frac{x^2}{x-1}\right):(x+1)=\frac{x^2-x-x^2}{x-1}:(x+1)=\frac{-x}{x^2-1}=\frac{x^2}{1-x^2}$

13) $\left(a+\frac{ab}{a-a}\right):4a^2=\frac{a^2-ab+ab}{a-b}:4a^2=\frac{a^2}{a-b}:4a^2=\frac{1}{4(a-b)}$

14) $\left(1+\frac{x}{y}\right):2(x+y)=\frac{y+x}{y}:2(x+y)=\frac{1}{2y}$

15) $\left(a-\frac{a^2}{a-1}\right):(a+1)=\frac{a^2-a-a^2}{a-1}:(a+1)=\frac{-a}{a^2-1}=\frac{a}{1-a^2}$

16) $\left(2-\frac{y}{x+2y}\right):(2x+3y)=\frac{2x+4y-y}{x+2y}:(2x+3y)=$

$=\frac{2x+3y}{x+2y}:(2x+3y)=\frac{1}{x+2y}$

17) $\left(\frac{x^3}{y^2}-\frac{3x^2}{y}+5x-7y+\frac{4y^2}{x}\right):(x-y)=$

$=\frac{x^4-3x^3y+5x^2y^2-7xy^3+4y^4}{xy^2(x-y)}$

II.

1) $x:\frac{1}{y}=x\cdot\frac{y}{1}=xy$ 2) $m:\frac{1}{m}=m^2$

3) $7b^2:\frac{7ab}{3c}=\frac{21b^2c}{7ab}=\frac{3bc}{a}$

4) $9a^3b^2y:\left(-\frac{6ab^2}{5xy}\right)=3a^2y:\left(-\frac{2}{5xy}\right)=-\frac{15a^2xy^2}{2}$

5) $(a+x):\frac{a+x}{y}=1:\frac{1}{y}=y$

6) $(a-x):\frac{y}{a-x}=\frac{(a-x)^2}{y}$

7) $(x^2-y^2):\frac{x-y}{x+y}=(x+y):\frac{1}{x+y}=(x+y)^2$

8) $(x^2-y^2):\frac{x+y}{x-y}=(x-y):\frac{1}{x-y}=(x-y)^2$

12.) $2a^2x^3 : \left(\frac{m}{x^2} - \frac{n}{a^3}\right) = 2a^2x^3 : \frac{a^3m - x^2n}{a^3x^2} =$

$= \frac{2a^5x^4}{a^3m - x^2n}$

13.) $27 : \left(3 + \frac{6x+6}{x^2-2x-3}\right) = 27 : \left(\frac{3x^2-6x-9+6x+6}{x^2-2x-3}\right) =$

$= 27 : \frac{3(x^2-1)}{x^2-2x-3} = 9 : \frac{x^2-1}{x^2-2x-3} = 9 : \frac{(x-1)(x+1)}{(x-3)(x+1)} =$

$= 9 : \frac{x-1}{x-3} = \frac{9(x-3)}{x-1}$

III. IV.

1.) $\frac{5a}{6b} : \frac{2b}{5a} = \frac{5a}{6b} \cdot \frac{5a}{2b} = \frac{25a^2}{12b^2}$

2.) $\frac{16x}{15y} : \frac{2x}{5y} = \frac{16x : 2x}{15y : 5y} = \frac{8}{3}$

3.) $-\frac{5ab^2}{y^2} : \frac{b}{y} = -\frac{5ab}{y}$

4.) $-\frac{3}{8x^2y^2} : -\frac{5}{4xy} = -\frac{3}{2xy} : -5 = \frac{3}{10xy}$

5.) $\frac{19ab^2}{16xy^2} : \frac{14ab}{9xy} = \frac{19b}{16y} : \frac{14}{9} = \frac{171b}{224y}$

6.) $\frac{x^2-y^2}{a^2-b^2} : \frac{a+b}{x+y} = \frac{(x-y)(x+y)^2}{(a-b)(a+b)^2}$

7.) $\frac{x^2-y^2}{a^2-b^2} : \frac{x+y}{a+b} = \frac{x-y}{a-b}$

8.) $\left(\frac{m^2}{n^2} - \frac{m}{n}\right) : \frac{m}{n} = \frac{m}{n} - 1 = \frac{m-n}{n}$

9.) $\left(\frac{21x^3}{5y^3} \pm \frac{15x^2}{7y^3}\right) : \frac{3x}{y} = \frac{7x^2}{5y^2} \pm \frac{5x}{7y^2} = \frac{49x^2 \pm 25x}{35y^2}$

10.) $\left(\frac{1}{x+y} \pm \frac{1}{x-y}\right) : \frac{xy}{x^2-y^2} = \frac{x-y}{xy} \pm \frac{x+y}{xy} = \frac{2}{y}$ i $-\frac{2}{x}$

11.) $\left(\frac{5a}{3bc} + \frac{4c}{3ab} - \frac{3b}{2ac}\right) : \frac{6}{abc} =$

$= \frac{10a^2+8c^2-9b^2}{6abc} : \frac{6}{abc} = \frac{10a^2+8c^2-9b^2}{36}$

12.) $\left(\frac{x}{y}+1\right) : \left(\frac{y}{x}-1\right) = \frac{x+y}{y} : \frac{y-x}{x} = \frac{x(x+y)}{y(y-x)}$

13.) $\left(\frac{a}{b} + \frac{x}{y}\right) : \left(\frac{a}{b} - \frac{x}{y}\right) = \frac{ay+bx}{by} : \frac{ay-bx}{by} = \frac{ay+bx}{ay-bx}$

14.) $\left(\frac{a^2}{b^2} - \frac{x^2}{y^2}\right) : \left(\frac{a}{b} - \frac{x}{y}\right) = \frac{a}{b} + \frac{x}{y} = \frac{ay+bx}{by}$

15.) $\left(\frac{x^2}{a^2} - \frac{a}{x^2}\right) : \left(\frac{a}{x^2} + \frac{1}{a}\right) = \frac{x^4-a^3}{a^2x^2} : \frac{a^2+x^2}{ax^2} =$

$= \frac{x^4-a^3}{a(a^2+x^2)}$

16.) $\left(\frac{a^2}{9} + \frac{a}{3} + \frac{1}{4}\right) : \left(\frac{a}{3} + \frac{1}{2}\right) = \frac{a}{3} + \frac{1}{2}$

$\frac{a^2}{9} + \frac{a}{6}$

$- \frac{a^2}{9} - \frac{a}{6}$

$+\frac{a}{6} + \frac{1}{4}$

$+\frac{a}{6} + \frac{1}{4}$

$- \frac{a}{6} - \frac{1}{4}$

0

17.) $\left(\frac{x^2}{4} - \frac{x}{5} + \frac{1}{25}\right) : \left(\frac{x}{2} - \frac{1}{5}\right) = \frac{x}{2} - \frac{1}{5}$

$\frac{x^2}{4} - \frac{x}{10}$

$- \frac{x^2}{4} + \frac{x}{10}$

$- \frac{x}{10} + \frac{1}{25}$

$- \frac{x}{10} + \frac{1}{25}$

$+ \frac{x}{10} - \frac{1}{25}$

0

18.) $\left(\frac{a^2}{x^2} + \frac{a}{6x} - \frac{1}{6}\right) : \left(\frac{a}{x} + \frac{1}{2}\right) = \frac{a}{x} - \frac{1}{3}$

$\frac{a^2}{x^2} + \frac{a}{2x}$

$- \frac{a^2}{x^2} - \frac{a}{2x}$

$\left(-\frac{2a}{6x} - \frac{1}{6}\right) = -\frac{a}{3x} - \frac{1}{6}$

$-\frac{a}{3x} - \frac{1}{6}$

$+\frac{a}{3x} + \frac{1}{6}$

0

19.) $\left(\frac{75x^2}{y^2} + \frac{4y}{5x} + 1\right) : \left(\frac{2x}{y} + \frac{1}{5}\right) = \frac{75x}{2y} - \frac{15}{2} + \frac{4y}{2x}$

$\frac{75x^2}{y^2} + \frac{15x}{y}$

$- \frac{75x^2}{y^2} - \frac{15x}{y}$

$- \frac{15x}{y} + \frac{4y}{5x} + 1$

$- \frac{15x}{y} - 3$

$+ \frac{4y}{5x} + 4$

$+ \frac{4y}{5x} + 4$

$- \frac{4y}{5x} - 4$

0

20.) $\left(\frac{6}{x^2}+\frac{16}{xy}-\frac{6}{y^2}\right):\left(\frac{6}{x}-\frac{2}{y}\right)=\frac{1}{x}+\frac{3}{y}$

$\frac{6}{x^2}-\frac{2}{xy}$

$-\quad +$

$+\frac{18}{xy}-\frac{6}{y^2}$

$+18 \quad -\frac{6}{y}$

$-\frac{xy}{} \quad +\frac{y^2}{}$

0

21.) $\left(\frac{x^3}{y^3}+\frac{y^3}{x^3}\right):\left(\frac{x^2}{y^2}-1+\frac{y^2}{x^2}\right)=\frac{x}{y}+\frac{y}{x}$

$\frac{x^3}{y^3}-\frac{x}{y}+\frac{y}{x}$

$-\quad +\quad -$

$+\frac{x}{y}-\frac{y}{x}+\frac{y^3}{x^3}$

$+\frac{x}{y}-\frac{y}{x}+\frac{y^3}{x^3}$

$-\quad +\quad -$

0

22.) $\left(\frac{x^4}{81}+\frac{4x^3}{9}+6x^2+36x+81\right):\left(\frac{x^2}{9}+2x+9\right)=$

$\frac{x^4}{81}+\frac{2x^3}{9}+x^2 \qquad =\frac{x^2}{9}+2x+9$

$-\quad -\quad -$

$+\frac{2x^3}{9}+5x^2+36x$

$-\frac{2x^3}{9}-4x^2-18x$

$+x^2+18x+81$

$+x^2+18x+81$

$-\quad -\quad -$

0

23.) $\frac{a+b}{\frac{a}{b}}=\frac{b(a+b)}{a}$

24.) $\frac{\frac{2a^2}{b}}{\frac{5a}{4b^3}}=\frac{2a^2}{b}\cdot\frac{4b^3}{5a}=\frac{8ab^2}{5}$

25.) $\frac{\frac{a+b}{m}}{\frac{c+d}{n}}=\frac{(a+b)n}{(c+d)m}$

26.) $\frac{1-\frac{a}{x}}{1-\frac{b}{x}}=\frac{\frac{x-a}{x}}{\frac{x-b}{x}}=\frac{x-a}{x-b}$

27.) $\frac{1}{1+\frac{b}{x}}=\frac{1}{\frac{x+b}{x}}=\frac{x}{x+b}$

28.) $\frac{\frac{2m}{5n}}{x+y}=\frac{2m}{5n(x+y)}$

29.) $\frac{\frac{2m}{5n}}{x+y}=\frac{2m(x+y)}{5n}$

30.) $\frac{1}{\frac{a}{b}-\frac{c}{d}}=\frac{1}{\frac{ad-bc}{bd}}=\frac{bd}{ad-bc}$

31.) $\frac{a-\frac{a}{b}}{1-\frac{1}{b}}=\frac{\frac{ab-a}{b}}{\frac{b-1}{b}}=\frac{a(b-1)}{b-1}=a$

32.) $\frac{1-\frac{1}{x}}{1+\frac{1}{x}}=\frac{\frac{x-1}{x}}{\frac{x+1}{x}}=\frac{x-1}{x+1}$

33.) $\frac{\frac{1}{x+1}+1}{\frac{1}{x+1}-1}=\frac{\frac{1+x+1}{x+1}}{\frac{1-x-1}{x+1}}=\frac{2+x}{-x}=-\frac{2+x}{x}$

34.) $\frac{\frac{a}{a-b}+\frac{b}{a+b}}{\frac{a}{a+b}-\frac{b}{a-b}}=\frac{\frac{a(a+b)+b(a-b)}{a^2-b^2}}{\frac{(a+b)b-(a-b)a}{ab}}=$

$=\frac{\frac{a^2+ab+ab-b^2}{a^2-b^2}}{\frac{ab+b^2-a^2+ab}{ab}}=\frac{ab(a^2+2ab-b^2)}{(a^2-b^2)(-a^2+2ab+b^2)}$

Kvadriranje i drugi korijen dekadskih brojeva

§63. Kvadriranje.

1.) 30^2

$3^2=9$

$2\cdot3\cdot0=0$

$0^2=0$

900

41^2

$4^2=16$

$2\cdot4\cdot1=8$

$1^2=1$

1681

56^2

$5^2=25$

$2\cdot5\cdot6=60$

$6^2=36$

3136

$80^2 = 6400$

93^2
$9^2 = 81$
$2.9.3 = 54$
$3^2 = 9$
8649

99^2
$9^2 = 81$
$2.9.9 = 162$
$9^2 = 81$
9801

2.) $13^2 = 169$; $24^2 = 576$; $46^2 = 2116$; $54^2 = 2916$
$62^2 = 3844$; $87^2 = 7569$

3.) 234^2
$2^2 = 4$
$43.3 = 129$
$464.4 = 1856$
54756

207^2
$2^2 = 4$
$407.7 = 2849$
42849

564^2
$5^2 = 25$
$106.6 = 636$
$1124.4 = 4496$
318096

678^2
$6^2 = 36$
$127.7 = 889$
$1348.8 = 10784$
459684

683^2
$6^2 = 36$
$128.8 = 1024$
$1363.3 = 4089$
466489

984^2
$9^2 = 81$
$188.8 = 1504$
$1964.4 = 7856$
968256

1035^2
$1^2 = 1$
$203.3 = 0609$
$2065.5 = 10325$
1071225

2401^2
$2^2 = 4$
$44.4 = 176$
$480.1 = 4801$
5764801

3526^2
$3^2 = 9$
$65.5 = 325$
$702.2 = 1404$
$7046.6 = 42276$
12432676

4737^2
$4^2 = 16$
$87.7 = 609$
$943.3 = 2829$
$9467.7 = 66269$
22439169

8007^2
$8^2 = 64$
$16007.7 = 112049$
64112049

8078^2
$8^2 = 64$
$1607.7 = 11249$
$16148.8 = 129184$
65254084

1736^2
$9^2 = 81$
$187.7 = 1309$
$1343.3 = 5829$
$14466.6 = 116796$
94789696

30524^2
$3^2 = 9$
$605.5 = 3025$
$6102.2 = 12204$
$61044.4 = 244176$
931714576

56072^2
$5^2 = 25$
$106.6 = 636$
$11207.7 = 78449$
$112142.2 = 224284$
3144069184

72395^2
$7^2 = 49$
$142.2 = 284$
$1443.3 = 4329$
$14469.9 = 130221$
$144785.5 = 723925$
5241036025

$\left(\frac{12}{15}\right)^2 = \frac{12^2}{15^2} = \frac{144}{225}$; $\left(\frac{39}{58}\right)^2 = \frac{1521}{3364}$

$\left(6\frac{9}{5}\right)^2 = \left(\frac{39}{5}\right)^2 = \frac{1521}{25}$; $\left(6\frac{5}{9}\right)^2 = \left(\frac{59}{9}\right)^2 = \frac{3481}{81}$

$\left(12\frac{7}{13}\right)^2 = \left(\frac{163}{13}\right)^2 = \frac{26569}{169}$

4.) 7.5^2
$7^2 = 49$
$145.5 = 725$
56.25

0.75^2
$7^2 = 49$
$145.5 = 725$
0.5625

$6 \cdot 56^2$

$6^2 = 36$

$125 \cdot 5 = 625$

$130_6 \cdot 6 = 7836$

$43\,0336$

$38 \cdot 724^2$

$3^2 = 9$

$68 \cdot 8 = 544$

$767 \cdot 7 = 5369$

$774_2 \cdot 2 = 15484$

$7744_4 \cdot 4 = 309776$

1499548176

Ne može, jer se uzima dvostruk broj dece = maksimum mjesta zadanog broja.

5.) $0{,}\dot{6}^2 = \left(\frac{6}{9}\right)^2 = \left(\frac{2}{3}\right)^2 = \frac{4}{9}$

$0{,}\dot{2}\dot{7}^2 = \left(\frac{27}{99}\right)^2 = \left(\frac{3}{11}\right)^2 = \frac{9}{121}$

$5{,}3\dot{6}^2 = \left(5\frac{36-3}{90}\right)^2 = \left(5\frac{33}{90}\right)^2 = \left(5\frac{11}{30}\right)^2 = \left(\frac{161}{30}\right)^2 = \frac{25921}{900}$

$2{,}3\dot{2}\dot{4}^2 = \left(2\frac{324-3}{990}\right)^2 = \left(2\frac{321}{990}\right)^2 = \left(2\frac{107}{330}\right)^2 = \left(\frac{767}{330}\right)^2 = \frac{588289}{108900}$

§64. Drugi korijen.

1.) $48^2 = 2304$

$\sqrt{23\,04} = 48$

16

$704 : 8_8$

704

$= = =$

134^2

169

1056

17956

$\sqrt{17956} = 134$

$1 = 79 : 2_3$

$1056 : 26_4$

$= = = =$

563^2

25

636

3369

316969

$\sqrt{316969} = 563$

$669 : 10_6$

$3369 : 112_3$

$= = = =$

807^2

64

11249

651249

$\sqrt{65\,12\,49} = 807$

$112 : 16$

$11249 : 1007$

$= = = = =$

7645^2

49

876

6096

76425

58446025

$\sqrt{58\,44\,60\,25} = 7645$

$944 : 14_6$

$6860 : 1524$

$76425 : 1528_5$

$= = = = =$

3086^2

9

4864

36996

9523396

$\sqrt{9\,52\,33\,96} = 3086$

$52 : 6$

$5233 : 608$

$36996 : 6166$

$= = = = =$

6005^2

36

060025

36060025

$\sqrt{36060025} = 6005$

$06 : 12$

$600 : 120$

$60025 : 12005$

$= = = = =$

2.) a.) $\sqrt{2\,85\,61} = 169$

$185 : 26$

$2961 : 329$

$= = = =$

b.) $\sqrt{61\,46\,56} = 784$

$1246 : 148$

$6256 : 1564$

$= = = =$

c.) $\sqrt{70\,72\,81} = 841$

$672 : 164$

$1681 : 1681$

$= = = =$

d.) $\sqrt{187\,41\,61} = 1369$

$87 : 23$

$1841 : 2669$

$24561 : 27229$

$= = = = =$

e.) $\sqrt{4\,87\,96\,81} = 2209$

$87 : 42$

$396 : 44$

$3681 : 4409$

$= = = = =$

f.) $\sqrt{54\,70\,98\,16} = 7396$

$570 : 143$

$14108 : 1469$

$88716 : 147866$

$= = = = =$

3.) a.) $\sqrt{45^2 + 28^2} = \sqrt{2025 + 784} = \sqrt{2809} = 53$

b) $\sqrt{247^2 + 96^2} = \sqrt{01009 + 9216} = \sqrt{70225} = 265$

c.) $\sqrt{73^2-48^2} = \sqrt{(73+48)(73-48)} = \sqrt{121 \cdot 25} =$
$= 11 \cdot 5 = 55$

Kod ovog zadatka upotrijebljena je formula: $a^2-b^2=(a+b)(a-b)$. Na taj način dobije se korijen iz produkta dvaju brojeva. Iz produkta dvaju ili više brojeva vadi se korijen tako, da se iz svakog faktora izvadi korijen, i dobiveni brojevi međusobno izmnože. N.p. $\sqrt{a^2b^2x^2} = abx$

d.) $\sqrt{85^2-36^2} = \sqrt{(85+36)(85-36)} = \sqrt{121 \cdot 49} =$
$= 11 \cdot 7 = 77$

e.) $\sqrt{593^2-465^2} = \sqrt{(593+465)(593-465)} =$
$= \sqrt{1058 \cdot 128} = \sqrt{529 \cdot 2 \cdot 64 \cdot 2} = \sqrt{529 \cdot 64 \cdot 4} =$
$= 23 \cdot 8 \cdot 2 = 368$

f.) $\sqrt{3249} + \sqrt{1089} = 57+33 = 90$

g.) $\sqrt{6241} - \sqrt{4624} = 79-68 = 11$

II. Drugi korijen iz decimalnih brojeva.

1.) a.) $\sqrt{112 \cdot 36} = 10 \cdot 6$
12 : 2
1236 : 20$_6$
= = = =

b.) $\sqrt{10,49,76} = 3 \cdot 24$
149 : 6$_2$
2576 : 64$_4$
= = = =

c.) $\sqrt{1131 \cdot 6496} = 33 \cdot 4$
231 : 6$_3$
4264 : 66$_6$
26896 : 672$_4$
= = = = =

d.) $\sqrt{0 \cdot 2401} = 0 \cdot 49$
16
801 : 8$_9$
= = =

e.) $\sqrt{0 \cdot 00,23,04} = 0 \cdot 048$
16
704 : 8$_8$
= = =

f.) $\sqrt{0 \cdot 00,75,69} = 0 \cdot 087$
64
1169 : 16$_7$
= = = =

2.) a.) $\sqrt{23,54,83} = 4 \cdot 85$..
754 : 8$_8$
5083 : 965
258

b.) $\sqrt{154 \cdot 2970} = 12 \cdot 421$...
54 : 2$_2$
1029 : 24$_4$
5370 : 248$_2$
40600 : 2484$_1$
15759

c.) $\sqrt{0 \cdot 08,74} = 0 \cdot 295$...
474 : 49
3300 : 585
375

d.) $\sqrt{0 \cdot 60} = 0 \cdot 774$...
1100 : 147
7100 : 1544
924

e.) $\sqrt{0 \cdot 10} = 0 \cdot 3162$...
100 : 6$_1$
3900 : 626
14400 : 632$_2$
1756

f.) $\sqrt{0 \cdot 01} = 0 \cdot 1$
==

g.) $\sqrt{0 \cdot 00,70} = 0 \cdot 0836$...
600 : 163
11100 : 166$_6$
1104

h.) $\sqrt{28 \cdot 74} = 5 \cdot 361$...
374 : 10$_3$
6574 : 106$_6$
17874 : 1071$_1$
7153

i.) $\sqrt{0 \cdot 78} = 0 \cdot 888$...
1488 : 168
14488 : 1768
344

k.) $\sqrt{0 \cdot 04,72} = 0 \cdot 2172$...
72 : 4$_1$
3100 : 427
11100 : 4342
2416

3.) a.) $\sqrt{3} = 1 \cdot 7320$...
200 : 27
1100 : 343
7100 : 3462
17600 : 3464

b.) $\sqrt{7} = 2 \cdot 6457$...
300 : 46
2408 : 524
30400 : 5285
397500 : 52907
27151

c.) $\sqrt{40} = 6 \cdot 324$...
400 : 123
3100 : 1262
57600 : 12644
7024

d.) $\sqrt{54} = 7 \cdot 348$...
500 : 143
7100 : 1464
124400 : 146888
6896

c.) $\sqrt{13,87} = 37 \cdot 242$

$487 : 67$

$1800 : 742$

$31600 : 7444$

$182400 : 74482$

33436

III. Drugi korijen iz razlomka.

1.) a.) $\sqrt{\frac{16}{49}} = \frac{\sqrt{16}}{\sqrt{49}} = \frac{4}{7}$ b.) $\sqrt{\frac{324}{169}} = \frac{\sqrt{324}}{\sqrt{169}} = \frac{18}{13}$

c.) $\sqrt{2\frac{126}{225}} = \sqrt{\frac{576}{225}} = \frac{24}{15} = \frac{8}{5}$

d.) $\sqrt{\frac{108}{147}} = \sqrt{\frac{36}{49}} = \frac{6}{7}$

2.) a.) $\sqrt{\frac{5}{6}} = \sqrt{\frac{30}{36}} = \frac{\sqrt{30}}{6} = \frac{5 \cdot 47}{6} = 0 \cdot 91\ldots$

Drugi način $\sqrt{\frac{5}{6}} = \sqrt{0 \cdot 83} = 0 \cdot 91\ldots$

b.) $\sqrt{3\frac{1}{2}} = \sqrt{\frac{7}{2}} = \sqrt{\frac{14}{4}} = \frac{\sqrt{14}}{2} = \frac{3 \cdot 741}{2} = 1 \cdot 870\ldots$

Drugi način: $\sqrt{3\frac{1}{2}} = \sqrt{3 \cdot 5} = 1 \cdot 870\ldots$

c.) $\sqrt{7\frac{3}{5}} = \sqrt{\frac{38}{5}} = \sqrt{\frac{190}{25}} = \frac{\sqrt{190}}{5} = \frac{13 \cdot 77}{5} = 2 \cdot 77\ldots$

Drugi način $\sqrt{7\frac{3}{5}} = \sqrt{7 \cdot 6} = 2 \cdot 77\ldots$

d.) $\sqrt{28\frac{4}{15}} = \sqrt{\frac{424}{15}} = \sqrt{\frac{6360}{225}} = \frac{78 \cdot 74}{15} = 5 \cdot 31\ldots$

Drugi način: $\sqrt{28\frac{4}{15}} = \sqrt{28 \cdot 26} = 5 \cdot 31\ldots$

e.) $\sqrt{53\frac{1}{8}} = \sqrt{\frac{425}{8}} = \sqrt{\frac{850}{16}} = \frac{29 \cdot 15}{4} = 7 \cdot 28\ldots$

Drugi način: $\sqrt{53\frac{1}{8}} = \sqrt{53 \cdot 125} = 7 \cdot 28\ldots$

---

§65. Kubiranje.

I. Vježbe.

1.) a.) $(x+1)^3 = x^3 + 3x^2 + 3x + 1 = 8 + 12 + 6 + 1 = 27 = 3^3$

b.) $(x-1)^3 = x^3 - 3x^2 + 3x - 1 = 8 - 12 + 6 - 1 = 1 = 1^3$

c.) $(2x+1)^3 = 8x^3 + 12x^2 + 6x + 1 = 64 + 48 + 12 + 1 = 125 = 5^3$

d.) $(2a-3)^3 = 8a^3 - 36a^2 + 54a - 27 = 64 - 144 + 108 - 27 =$

$= 1 = 1^3$

e.) $(4a+b)^3 = 64a^3 + 48a^2b + 12ab^2 + b^3 =$

$= 1728 + 3024 + 1764 + 343 = 6859 = 19^3$

f.) $(5a-2b)^3 = 125a^3 - 150a^2b + 60ab^2 - 8b^3 =$

$= 3375 - 9450 + 8820 - 2744 = 1 = 1^3$

g.) $(7-2a)^3 = 343 - 294a + 84a^2 - 8a^3 =$

$= 343 - 882 + 756 - 216 = 1 = 1^3$

2.) a.) $(a+b+2)^3 = a^3 + 3a^2b + 3ab^2 + b^3 + 6a^2 +$

$+ 12ab + 6b^2 + 12a + 12b + 8$

b.) $(x-y+2)^3 = (x-y)^3 + 3(x-y)^2 \cdot 2 + 3(x-y) \cdot 2^2 + 2^3 =$

$= x^3 - 3x^2y + 3xy^2 - y^3 + 6x^2 - 12xy + 6y^2 + 12x - 12y + 8 =$

$= 64 - 240 + 300 - 125 + 96 - 240 + 150 + 48 - 60 + 8 = 1 = 1^3$

3.) a.) $(a+b)^3 + (a-b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 + a^3 - 3a^2b +$

$+ 3ab^2 - b^3 = 2a^3 + 6ab^2 = 16 + 12 = 28 = 3^3 + 1^3$

b.) $(a+b)^3 - (a-b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 - a^3 + 3a^2b -$

$- 3ab^2 + b^3 = 6a^2b + 2b^3 = 24 + 2 = 26 = 3^3 - 1^3$

c.) $x^3 - (x-y)^3 = x^3 - (x^3 - 3x^2y + 3xy^2 - y^3) =$

$= x^3 - x^3 + 3x^2y - 3xy^2 + y^3 = 3x^2y - 3xy^2 + y^3 = 225 - 135 + 27 =$

$= 117 = 125 - 8$

d.) $x(x+1)(x+2) - (x+1)^3 = (x^2+x)(x+2) - (x^3 + 3x^2 + 3x + 1) =$

$= x^3 + 3x^2 + 2x - x^3 - 3x^2 - 3x - 1 = -x - 1 = -6 - 1 = -7$

$6(6+1)(6+2) - (6+1)^3 = 336 - 343 = -7$

II. Vježbe

1.) a.) $30^3 = 27000$ b.) $600^3 = 216000000$

c.) $800^3 = 512000000$

d.) $4000^3 = 64000000000$

2.) a.) $(4D)^3 = 64T = 64000$

b.) $(7S)^3 = 343M = 343000000$

c.) $(2T)^3 = 8tM = 8000000000$

3.) a.) $0{\cdot}7^3 = 0{\cdot}343$

b.) $0{\cdot}05^3 = 0{\cdot}000125$

c.) $0{\cdot}002^3 = 0{\cdot}000000008$

d.) $0{\cdot}0009^3 = 0{\cdot}000000000729$

4.) a.) $(8d)^3 = 512t = 0{\cdot}512$

b.) $(3s)^3 = 27m = 0{\cdot}000027$

c.) $(1t)^3 = 1tm = 0{\cdot}000000001$

d.) $(7t)^3 = 343tm = 0{\cdot}000000343$

III. Vježbe.

1.) a.) 16^3

$1^3 = 1$
$3.1^2.6 = 18$
$3.1.6^2 = 108$
$6^3 = 216$
4096

b.) 19^3

$1^3 = 1$
$3.1^2.9 = 27$
$3.1.9^2 = 243$
$9^3 = 729$
6859

c.) 24^3

$2^3 = 8$
$3.2^2.4 = 48$
$3.2.4^2 = 96$
$4^3 = 64$
13824

d.) 27^3

$2^3 = 8$
$3.2^2.7 = 84$
$3.2.7^2 = 294$
$7^3 = 343$
19683

e.) 38^3

$3^3 = 27$
$3.3^2.8 = 216$
$3.3.8^2 = 576$
$8^3 = 512$
54872

f.) 54^3

$5^3 = 125$
$3.5^2.4 = 300$
$3.5.4^2 = 240$
$4^3 = 64$
157464

g.) 76^3

$7^3 = 343$
$3.7^2.6 = 882$
$3.7.6^2 = 756$
$6^3 = 216$
438976

h.) 81^3

$8^3 = 512$
$3.8^2.1 = 192$
$3.8.1^2 = 24$
$1^3 = 1$
531441

2.) a.) 124^3

$1^3 = 1$
$3.1^2.2 = 6$
$3.1.2^2 = 12$
$2^3 = 8$
$3.12^2.4 = 1728$
$3.12.4^2 = 576$
$4^3 = 64$
1906624

b.) 116^3

$1^3 = 1$
$3.1^2.1 = 3$
$3.1.1^2 = 3$
$1^3 = 1$
$3.11^2.6 = 2178$
$3.11.6^2 = 1188$
$6^3 = 216$
1560896

c.) 407^3

$4^3 = 64$
$3.4^2.0 =$.
$3.4.0^2 =$.
$0^3 =$
$3.40^2.7 = 33600$
$3.40.7^2 = 5880$
$7^3 = 343$
67419143

d.) 2145^3

$2^3 = 8$
$3.2^2.1 = 12$
$3.2.1^2 = 6$
$1^3 = 1$
$3.21^2.4 = 5292$
$3.21.4^2 = 1008$
$4^3 = 64$
$3.214^2.5 = 686940$
$3.214.5^2 = 16050$
$5^3 = 125$
9869198625

f.) 2007^3

$2^3 = 8$.....
$3.200^2.7 = 840000$
$3.200.7^2 = 29400$
$7^3 = 343$
8084294343

e.) 2056^3

$2^3 = 8$...
$3.20^2.5 = 6000$
$3.20.5^2 = 1500$
$5^3 = 125$
$3.205^2.6 = 756450$
$3.205.6^2 = 22140$
$6^3 = 216$
8690991616

g.) 7641^3

$7^3 = 343$
$3 \cdot 7^2 \cdot 6 = 882$
$3 \cdot 7 \cdot 6^2 = 756$
$6^3 = 216$
$3 \cdot 76^2 \cdot 4 = 69312$
$3 \cdot 76 \cdot 4^2 = 3648$
$4^3 = 64$
$3 \cdot 764^2 \cdot 1 = 1751088$
$3 \cdot 764 \cdot 1^2 = 2292$
$1^3 = 1$
$= 446118875721$

Kubiranje decimalnih brojeva i racionalnog.

1.) a.) 1.4^3

$1^3 = 1$
$3 \cdot 1^2 \cdot 4 = 12$
$3 \cdot 1 \cdot 4^2 = 48$
$4^3 = 64$
$= 2744$

b.) 2.7^3

$2^3 = 8$
$3 \cdot 2^2 \cdot 7 = 84$
$3 \cdot 2 \cdot 7^2 = 294$
$7^3 = 343$
$= 19.683$

c.) 86^3

$8^3 = 512$
$3 \cdot 8^2 \cdot 6 = 1152$
$3 \cdot 8 \cdot 6^2 = 864$
$6^3 = 216$
$= 636.056$

d.) 0.45^3

$4^3 = 64$
$3 \cdot 4^2 \cdot 5 = 240$
$3 \cdot 4 \cdot 5^2 = 300$
$5^3 = 125$
$= 0.091125$

e.) 0.0078^3

$7^3 = 343$
$3 \cdot 7^2 \cdot 8 = 1176$
$3 \cdot 7 \cdot 8^2 = 1344$
$8^3 = 512$
$= 0.000000474552$

2.) a.) 3.14^3

$3^3 = 27$
$3 \cdot 3^2 \cdot 1 = 27$
$3 \cdot 3 \cdot 1^2 = 9$
$1^3 = 1$
$3 \cdot 31^2 \cdot 4 = 11532$
$3 \cdot 31 \cdot 4^2 = 1488$
$4^3 = 64$
$= 30.959144$

b.) 2.06^3

$2^3 = 8$
$3 \cdot 20^2 \cdot 6 = 7200$
$3 \cdot 20 \cdot 6^2 = 2160$
$6^3 = 216$
$= 8.741816$

c.) 0.562^3

$5^3 = 125$
$3 \cdot 5^2 \cdot 6 = 450$
$3 \cdot 5 \cdot 6^2 = 540$
$6^3 = 216$
$3 \cdot 56^2 \cdot 2 = 18816$
$3 \cdot 56 \cdot 2^2 = 672$
$2^3 = 8$
$= 0.177504328$

d.) 23.4^3

$2^3 = 8$
$3 \cdot 2^2 \cdot 3 = 36$
$3 \cdot 2 \cdot 3^2 = 54$
$3^3 = 27$
$3 \cdot 23^2 \cdot 4 = 6348$
$3 \cdot 23 \cdot 4^2 = 1104$
$4^3 = 64$
$= 12812.904$

e.) 0.0857^3

$8^3 = 512$
$3 \cdot 8^2 \cdot 5 = 960$
$3 \cdot 8 \cdot 5^2 = 600$
$5^3 = 125$
$3 \cdot 85^2 \cdot 7 = 151725$
$3 \cdot 85 \cdot 7^2 = 12495$
$7^3 = 343$
$= 0.000629422793$

f.) 42.35^3

$4^3 = 64$
$3 \cdot 4^2 \cdot 2 = 96$
$3 \cdot 4 \cdot 2^2 = 48$
$2^3 = 8$
$3 \cdot 42^2 \cdot 3 = 15876$
$3 \cdot 42 \cdot 3^2 = 1134$
$3^3 = 27$
$3 \cdot 423^2 \cdot 5 = 2683935$
$3 \cdot 423 \cdot 5^2 = 31725$
$5^3 = 125$
$= 75955677875$

g.) 72.06^3

$7^3 = 343$
$3 \cdot 7^2 \cdot 2 = 294$
$3 \cdot 7 \cdot 2^2 = 84$
$2^3 = 8$
$3 \cdot 720^2 \cdot 6 = 9331200$
$3 \cdot 720 \cdot 6^2 = 77760$
$6^3 = 216$
$= 374181877816$

3.) a.) $\left(\frac{15}{17}\right)^3 = \frac{3375}{4913}$; b.) $\left(2\frac{5}{6}\right)^3 = \left(\frac{17}{6}\right)^3 = \frac{4913}{216}$

c.) $\left(45\frac{3}{4}\right)^3 = \left(\frac{183}{4}\right)^3 = \frac{6128487}{64}$

d.) $\left(62\frac{3}{8}\right)^3 = \left(\frac{499}{8}\right)^3 = \frac{124251499}{512}$

4.) a.) $\left(\frac{1}{2}\right)^3 = \frac{1}{8} = 0.125$; $\left(\frac{1}{2}\right)^3 = 0.5^3 = 0.125$

b.) $\left(\frac{4}{5}\right)^3 = \frac{64}{125} = 0.512$; $\left(\frac{4}{5}\right)^3 = 0.8^3 = 0.512$

c.) $(3\frac{1}{8})^3 = (\frac{25}{8})^3 = \frac{15625}{512} = 30{,}517578125$

Drugi način: $(3\frac{1}{8})^3 = 3{,}125^3 = 30{,}517578125$

d.) $(7\frac{3}{4})^3 = (\frac{31}{4})^3 = \frac{29791}{64} = 465{,}484375$

Drugi način: $(7\frac{3}{4})^3 = 7{,}75^3 = 465{,}484375$

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§.66. Treći korijen

1.) a.) 426^3

$4^3 = 64$

$3\cdot4^2\cdot2 = 96$

$3\cdot4\cdot2^2 = 48$

$2^3 = 8$

$3\cdot42^2\cdot6 = 31752$

$3\cdot42\cdot6^2 = 4536$

$6^3 = 216$

77308776

$\sqrt[3]{77308776} = 426$

64

$133\,08 : 3\cdot4^2 = (48)$

96 ($3\cdot4^2\cdot2$)

48 ($3\cdot4\cdot2^2$)

8 (2^3)

$3220776 : 3\cdot42^2 = (5292)$

31752 ($3\cdot42^2\cdot6$)

4536 ($3\cdot42\cdot6^2$)

216 (6^3)

b.) 758^3

$7^3 = 343$

$3\cdot7^2\cdot5 = 735$

$3\cdot7\cdot5^2 = 525$

$5^3 = 125$

$3\cdot75^2\cdot8 = 135000$

$3\cdot75\cdot8^2 = 14400$

$8^3 = 512$

435519512

$\sqrt[3]{435\,519\,512} = 758$

343

$92519 : 3\cdot7^2 = (147)$

735 ($3\cdot7^2\cdot5$)

525 ($3\cdot7\cdot5^2$)

125 (5^3)

$13644512 : 3\cdot75^2 = (16875)$

135000 ($3\cdot75^2\cdot8$)

14400 ($3\cdot75\cdot8^2$)

512 (8^3)

c.) 345^3

$3^3 = 27$

$3\cdot3^2\cdot4 = 108$

$3\cdot3\cdot4^2 = 144$

$4^3 = 64$

$3\cdot34^2\cdot5 = 17340$

$3\cdot34\cdot5^2 = 2550$

$5^3 = 125$

41063625

$\sqrt[3]{41063625} = 345$

27

$14063 : 3\cdot3^2 = (27)$

108 ($3\cdot3^2\cdot4$)

144 ($3\cdot3\cdot4^2$)

64 (4^3)

$1759625 : 3\cdot34^2 = (3468)$

17340 ($3\cdot34^2\cdot5$)

2550 ($3\cdot34\cdot5^2$)

125 (5^3)

d.) 507^3

$5^3 = 125\ldots$

$3\cdot50^2\cdot7 = 52500$

$3\cdot50\cdot7^2 = 7350$

$7^3 = 343$

130323843

$\sqrt[3]{130323843} = 507$

125

$=5323 : 3\cdot5^2 = (75)$

$53238\,43 : 3\cdot50^2 = (7500)$

52500 ($3\cdot50^2\cdot7$)

7350 ($3\cdot50\cdot7^2$)

343 (7^3)

2.) a.) $\sqrt[3]{12\,167} = 23$

8

$4\,167 : 3\cdot2^2 = (12)$

36 ($3\cdot2^2\cdot3$)

54 ($3\cdot2\cdot3^2$)

27 (3^3)

b.) $\sqrt[3]{3\,375} = 15$

1

$2\,375 : 3\cdot1^2 = (3)$

15 ($3\cdot1^2\cdot5$)

75 ($3\cdot1\cdot5^2$)

125 (5^3)

c.) $\sqrt[3]{681472} = 88$

512

$169\,472 : 3\cdot8^2 = (192)$

1536 ($3\cdot8^2\cdot8$)

1536 ($3\cdot8\cdot8^2$)

512 (8^3)

d.) $\sqrt[3]{1\,860\,867} = 123$

1

$=860 : 3\cdot1^2 = (3)$

6 ($3\cdot1^2\cdot2$)

12 ($3\cdot1\cdot2^2$)

8 (2^3)

$132867 : 3\cdot12^2 = (432)$

1296 ($3\cdot12^2\cdot3$)

324 ($3\cdot12\cdot3^2$)

27 (3^3)

e.) $\sqrt[3]{887\,503\,681} = 961$

729

$158\,503 : 3\cdot9^2 = (243)$

1458 ($3\cdot9^2\cdot6$)

972 ($3\cdot9\cdot6^2$)

216 (6^3)

$27676\,81 : 3\cdot96^2 = (27648)$

27648 ($3\cdot96^2\cdot1$)

288 ($3\cdot96\cdot1^2$)

1 (1^3)

f.) $\sqrt[3]{2\,176\,782\,336} = 1296$

1 | 1 176 : $3 \cdot 1^2 = (3)$
6 | 12 8 : $3 \cdot 1^2 \cdot 2$
448 | 7 82 : $3 \cdot 12^2 = (432)$
3888 : $3 \cdot 12^2 \cdot 9$
2916 : $3 \cdot 12 \cdot 9^2$
729 : 9^3
30093 | 336 : $3 \cdot 129^2 = (49923)$
29938 : $3 \cdot 129^2 \cdot 6$
13932 : $3 \cdot 129 \cdot 6^2$
216 : 6^3
= = = = = = = = =

g.) $\sqrt[3]{481\,890\,304} = 784$

343 | 138 90 : $3 \cdot 7^2 = (147)$
1176 : $3 \cdot 7^2 \cdot 8$
1344 : $3 \cdot 7 \cdot 8^2$
512 : 8^3
733830 | 4 : $3 \cdot 78^2 = (18252)$
730008 : $3 \cdot 78^2 \cdot 4$
3744 : $3 \cdot 78 \cdot 4^2$
64 : 4^3
= = = = = = = =

h.) $\sqrt[3]{225\,199\,600\,704} = 6084$

216 | = = 9 199 : $3 \cdot 6^2 = (108)$
91996 00 : $3 \cdot 60^2 = (10800)$
86400 : $3 \cdot 60^2 \cdot 8$
11520 : $3 \cdot 60 \cdot 8^2$
512 : 8^3
4438887 | 04 : $3 \cdot 608^2 = (1108992)$
4435968 : $3 \cdot 608^2 \cdot 4$
2918 4 : $3 \cdot 608 \cdot 4^2$
64 : 4^3
= = = = = = = = =

Zadatci.

1.) a.) $\sqrt[3]{262 \cdot 144} = 6 \cdot 4$

216 | 46 144 : $3 \cdot 6^2 = (108)$
432 : $3 \cdot 6^2 \cdot 4$
288 : $3 \cdot 6 \cdot 4^2$
64 : 4^3
= = = = =

b.) $\sqrt[3]{16\,777 \cdot 216} = 25 \cdot 6$

8 | 8 777 : $3 \cdot 2^2 = (12)$
60 : $3 \cdot 2^2 \cdot 5$
150 : $3 \cdot 2 \cdot 5^2$
125 : 5^3
11522 | 16 : $3 \cdot 25^2 = (1875)$
11250 : $3 \cdot 25^2 \cdot 6$
2700 : $3 \cdot 25 \cdot 6^2$
216 : 6^3
= = = = = = =

c.) $\sqrt[3]{3 \cdot 176\,523} = 1 \cdot 47$

1 | 2 176 : $3 \cdot 1^2 = (3)$
12 : $3 \cdot 1^2 \cdot 4$
48 : $3 \cdot 1 \cdot 4^2$
64 : 4^3
4325 | 23 : $3 \cdot 14^2 = (588)$
4116 : $3 \cdot 14^2 \cdot 7$
2058 : $3 \cdot 14 \cdot 7^2$
343 : 7^3
= = = = = =

d.) $\sqrt[3]{0 \cdot 262\,144} = 0 \cdot 64$

216 | 46 144 : $3 \cdot 6^2 = (108)$
432 : $3 \cdot 6^2 \cdot 4$
288 : $3 \cdot 6 \cdot 4^2$
64 : 4^3
= = = = =

e.) $\sqrt[3]{0 \cdot 013\,824} = 0 \cdot 24$

8 | 5 824 : $3 \cdot 2^2 = 12$
48 : $3 \cdot 2^2 \cdot 4$
96 : $3 \cdot 2 \cdot 4^2$
64 : 4^3
= = = = =

f.) $\sqrt[3]{0 \cdot 713} = 0 \cdot 893\ldots$

512 | 201 000 : $3 \cdot 8^2 = (192)$
172 8
1944
729
80310 00 : $3 \cdot 89^2 = (23763)$
71289 : $3 \cdot 89^2 \cdot 3$
2403 : $3 \cdot 89 \cdot 3^2$
27 : 3^3
878043

g.) $\sqrt[3]{0{,}004130} = 0{,}1604\ldots$

$\frac{1}{3}130 : 3.1^2 = (3)$
$18 \quad 3.1^2 6$
$108 \quad 3.1.6^2$
$216 \quad 6^3$
$34000 : 3.16^2 = (768)$
$34000000 : 3.160^2 = (76800)$
$307200 \quad 3.160^2 4$
$7680 \quad 3.160.4^2$
$64 \quad 4^3$
3203136

h.) $\sqrt[3]{0{,}400} = 0{,}736\ldots$

$\frac{343}{57000} : 3.7^2 = (147)$
$441 \quad 3.7^2 3$
$189 \quad 3.7.3^2$
$27 \quad 3^3$
$10983000 : 3.73^2 = (15987)$
$95922 \quad 3.73^2 6$
$7884 \quad 3.73.6^2$
$216 \quad 6^3$
1311744

2.)a.) $\sqrt[3]{2} = 1{,}25\ldots$

$\frac{1}{1000} : 3.1^2 = (3)$
$612 \quad 3.1^2 2$
$8 \quad 3.1.2^2$
2^3
$272000 : 3.12^2 = (432)$
$2160 \quad 3.12^2 5$
$900 \quad 3.12.5^2$
$125 \quad 5^3$
46875

b.) $\sqrt[3]{3} = 1{,}44\ldots$

$\frac{1}{2000} : 3.1^2 = (3)$
$12 \quad 3.1^2 4$
$48 \quad 3.1.4^2$
$64 \quad 4^3$
$256000 : 3.14^2 = (588)$
$2352 \quad 3.14^2 4$
$672 \quad 3.14.4^2$
$64 \quad 4^3$
140616

c.) $\sqrt[3]{20} = 2{,}71\ldots$

$\frac{8}{12000} : 3.2^2 = (12)$
$84 \quad 3.2^2 7$
$294 \quad 3.2.7^2$
$343 \quad 7^3$
$317000 : 3.27^2 = (2187)$
$2187 \quad 3.27^2 1$
$81 \quad 3.27.1^2$
$1 \quad 1^3$
97489

d.) $\sqrt[3]{65} = 4{,}02\ldots$

$\frac{64}{1000} : 3.4^2 = (48)$
$1000000 : 3.40^2 = (4800)$
$9600 \quad 3.40^2 2$
$480 \quad 3.40.2^2$
$8 \quad 2^3$
35192

e.) $\sqrt[3]{510} = 7{,}98\ldots$

$\frac{343}{167000} : 3.7^2 = (147)$
$1323 \quad 3.7^2 9$
$1701 \quad 3.7.9^2$
$729 \quad 9^3$
$169610000 : 3.79^2 = (18723)$
$1499784 \quad 3.79^2 8$
$15168 \quad 3.79.8^2$
$512 \quad 8^3$
1830408

f.) $\sqrt[3]{1005} = 10{,}01$

$\frac{1}{=}005 : 3.1^2 = (3)$
$5000 : 3.10^2 = (300)$
$5000000 : 3.100^2 = (30000)$
$30000 \quad 3.100^2 1$
$300 \quad 3.100.1^2$
$1 \quad 1^3$
1996999

g.) $\sqrt[3]{8{,}539} = 20{,}43$

$\frac{8}{=}539 : 3.2^2 = (12)$
$539000 : 3.20^2 = (1200)$
$4800 \quad 3.20^2 4$
$960 \quad 3.20.4^2$
$64 \quad 4^3$
$49336000 : 3.204^2 = (124848)$
$3745544 \quad 3.204^2 3$
$5508 \quad 3.204.3^2$
$27 \quad 3^3$
11826493

III. Zavalocci

1.)a.) $\sqrt[3]{\frac{512}{729}} = \frac{8}{9}$; b.) $\sqrt[3]{\frac{2744}{2197}} = \frac{14}{13}$

c.) $\sqrt[3]{1\frac{3429}{5832}} = \sqrt[3]{\frac{9261}{5832}} = \frac{21}{18} = \frac{7}{6}$

d.) $\sqrt[3]{2\frac{749}{1313}} = \sqrt[3]{\frac{3375}{1313}} = \frac{15}{\sqrt[3]{1313}} = \frac{15}{10{,}95\ldots}$

2.) a.) $\sqrt[3]{\frac{3}{4}} = \sqrt[3]{0{,}750} = 0{,}908\ldots$

729

21000 : $3 \cdot 9^2 = (243)$

21000000 : $3 \cdot 90^2 = (24300)$

194400 $\quad 3 \cdot 90^2 \cdot 8$

17280 $\quad 3 \cdot 90 \cdot 8^2$

512 $\quad 8^3$

13866888

Drugi način: $\sqrt[3]{\frac{3}{4}} = \frac{1{,}44\ldots}{1{,}58\ldots} = 0{,}908\ldots$

b.) $\sqrt[3]{3\frac{1}{2}} = \sqrt[3]{\frac{7}{2}} = \sqrt[3]{\frac{28}{8}} = \frac{3{,}03}{2} = 1{,}51\ldots$

$\sqrt[3]{3\frac{1}{2}} = \sqrt[3]{3{,}5} = 1{,}518$

1

2500 : $3 \cdot 1^2 = (3)$

15 $\quad 3 \cdot 1^2 \cdot 5$

75 $\quad 3 \cdot 1 \cdot 5^2$

125 $\quad 5^3$

1250000 : $3 \cdot 15^2 = (675)$

675

45

1

57049000 : $3 \cdot 151^2 = (68403)$

54724 $\quad 3 \cdot 151^2 \cdot 8$

28992 $\quad 3 \cdot 151 \cdot 8^2$

512 $\quad 8^3$

20361688

c.) $\sqrt[3]{12\frac{3}{5}} = \sqrt[3]{\frac{63}{5}} = \sqrt[3]{\frac{1575}{125}} = \frac{11{,}63}{5} = 2{,}32\ldots$

$\sqrt[3]{12\frac{3}{5}} = \sqrt[3]{12{,}6} = 2{,}326\ldots$

8

4600 : $3 \cdot 2^2 = (12)$

36

54 $\quad 3 \cdot 2^2 \cdot 3$

27 $\quad 3 \cdot 2 \cdot 3^2$

3^3

4330000 : $3 \cdot 23^2 = (1587)$

3174 $\quad 3 \cdot 23^2 \cdot 2$

276

8 $\quad 3 \cdot 23 \cdot 2^2$

2^3

11283200 : $3 \cdot 232^2 = (161472)$

9688832

250056

216

15698024

d.) $\sqrt[3]{8\frac{14}{15}} = \sqrt[3]{8{,}93} = 2{,}074\ldots$

8

93 : $3 \cdot 2^2 = (12)$

93333 : $3 \cdot 20^2 = (1200)$

8400 $\quad 3 \cdot 20^2 \cdot 7$

2940 $\quad 3 \cdot 20 \cdot 7^2$

343 $\quad 7^3$

6359033 : $3 \cdot 207^2 = (128547)$

5741188 $\quad 3 \cdot 207^2 \cdot 4$

9936

64 $\quad 3 \cdot 207 \cdot 4^2$

4^3

12072109

$\sqrt[3]{8\frac{14}{15}} = \sqrt[3]{\frac{134}{15}} = \sqrt[3]{\frac{134 \cdot 15^2}{15^3}} = \sqrt[3]{\frac{30150}{15^3}} = \frac{31{,}12}{15} = 2{,}07\ldots$

$\sqrt[3]{30150} = 31{,}12$

27

3150 : $3 \cdot 3^2 = (27)$

27 $\quad 3 \cdot 3^2 \cdot 1$

9 $\quad 3 \cdot 3 \cdot 1^2$

1 $\quad 1^3$

3590000 : $3 \cdot 31^2 = (2883)$

2883 $\quad 3 \cdot 31^2 \cdot 1$

93 $\quad 3 \cdot 31 \cdot 1^2$

1 $\quad 1^3$

69769000 : $3 \cdot 311^2 = (290163)$

5803326 $\quad 3 \cdot 311^2 \cdot 2$

3732

8 $\quad 3 \cdot 311 \cdot 2^2$

2^3

11699072

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§ 69. Rješavanje linearnih jednadžbi s jednom nepoznanicom.

1.) $x + 4 = 7$

$x = 7 - 4$

$x = 3$

2.) $x - 6 = 5$

$x = 5 + 6$

$x = 11$

3.) $5 + x = 7$

$x = 7 - 5$

$x = 2$

4.) $x + 4\frac{1}{2} = 7\frac{3}{4}$

$x = \frac{31}{4} - \frac{9}{2}$

$x = \frac{31}{4} - \frac{18}{4}$

$x = \frac{13}{4} = 3\frac{1}{4}$

5.) $x - 3\frac{3}{4} = 6\frac{1}{4}$

$x = \frac{45}{4} + \frac{15}{4}$

$x = \frac{40}{4}$

$x = 10$

6.) $3 \cdot 4 + x = 5\frac{1}{2}$

$x = 5 \cdot 5 - 3 \cdot 4$

$x = 2 \cdot 1$

7.) $8 - x = 2\frac{3}{5}$

$x - 8 = -2\frac{3}{5}$

$x = 8 - 2\frac{3}{5}$

$x = 5\frac{2}{5}$

8.) $x - 3a = 7a$

$x = 7a + 3a$

$x = 10a$

9.) $x - 5a = 2a$

$x = 2a + 5a$

$x = 7a$

10.) $x + 3m = n$

$x = n - 3m$

11.) $a = x + 5$

$-x = -a + 5$

$x = a - 5$

12.) $x + a - b = 0$

$x = b - a$

13.) $x - 2n + 7 = m$

$x = m + 2n - 7$

14.) $x - \frac{a}{3} = \frac{a}{6}$

$x = \frac{a}{6} + \frac{2a}{6}$

$x = \frac{3a}{6}$

$x = \frac{a}{2}$

15.) $\frac{a+b}{2} - x = \frac{a-b}{2}$

$-x = \frac{a-b}{2} - \frac{a+b}{2}$

$x = \frac{a+b}{2} - \frac{a-b}{2}$

$x = \frac{a+b-a+b}{2}$

$x = b$

16.) $\frac{m}{3} = x + \frac{m-1}{6}$

$-x = \frac{m-1}{6} - \frac{m}{3}$

$x = \frac{2m}{6} - \frac{m-1}{6}$

$x = \frac{2m - m + 1}{6}$

$x = \frac{m+1}{6}$

17.) $\frac{a}{3} = x + \frac{b}{3}$

$x = \frac{a}{3} - \frac{b}{3}$

$x = \frac{a-b}{3}$

18.) $\frac{m-n}{2} = x - \frac{3}{2}(m+n)$

$x = \frac{m-n}{2} + \frac{3m+3n}{2}$

$x = \frac{m-n+3m+3n}{2}$

$x = 2m + n$

19.) $4x = 20$

$x = \frac{20}{4}$

$x = 5$

20.) $2x = 6$

$x = \frac{6}{2}$

$x = 3$

21.) $3x + 2 = 18$

$3x = 16$

$x = \frac{16}{3}$

22.) $5x - 3 = 22$

$5x = 25$

$x = \frac{25}{5}$

$x = 5$

23.) $8x = -56$

$x = -\frac{56}{8}$

$x = -7$

24.) $7x = 64 - x$

$7x + x = 64$

$8x = 64$

$x = 8$

25.) $89 - 14x = -9$

$-14x = -89 - 9$

$-14x = -98$

$x = \frac{98}{14}$

$x = 7$

26.) $3x = a$

$x = \frac{a}{3}$

27.) $2x = a + b$

$x = \frac{a+b}{2}$

28.) $35x = 7$

$5x = 1$

$x = \frac{1}{5}$

29.) $5ax = 25a^2$

$x = 5a$

30.) $(a-b)x = a^2 - b^2$

$x = \frac{(a+b)(a-b)}{a-b}$

$x = a + b$

Pamti: $(a+b)(a-b) = a^2 - b^2$

Riječima: Zbroj puta razlika istih članova daje kao produkt razliku njihovih kvadrata.

31.) $0{\cdot}7x = 6{\cdot}3$

$\frac{x}{10} = 0{\cdot}9$

$x = 9$

32.) $1{\cdot}23x = 18{\cdot}45$

$x = \frac{1845}{123}$

$x = 15$

33.) $m^3 - n^3 = (m-n)x$

$x = \frac{m^3 - n^3}{m-n}$

$x = m^2 + mn + n^2$

34.) $\frac{x}{4} = 2$

$x = 4 \cdot 2 = 8$

35.) $\frac{x}{3} = a$

$x = 3a$

36.) $\frac{x}{0{\cdot}4} = 1$

$x = 0{\cdot}4$

37.) $\frac{x}{m} = n$

$x = mn$

38.) $\frac{x}{3a} = \frac{a}{3}$

$\frac{x}{a} = a$

$x = a^2$

39.) $\frac{x}{m-n} = m+n$

$x = (m+n)(m-n)$

$x = m^2 - n^2$

40.) $x : 2\frac{1}{3} = 5\frac{3}{4}$

$x : \frac{7}{3} = \frac{23}{4}$

$x = \frac{23}{4} \cdot \frac{7}{3}$

$x = \frac{161}{12} = 13\frac{5}{12}$

41.) $\frac{x}{5\frac{1}{2}} = 1\frac{1}{3}$

$\frac{x}{\frac{11}{2}} = \frac{4}{3}$

$x = \frac{4}{3} \cdot \frac{11}{2}$

$x = \frac{22}{3}$

42.) $7x - 4 = 24$

$7x = 28$

$x = 4$

43.) $11 + 19x = 49$

$19x = 38$

$x = 2$

44.) $63 - 7x = -35$

$7x = 98$

$x = 14$

45.) $4(x-3) = 16$

$x - 3 = 4$

$x = 7$

46.) $2(x+4) - 9 = 11$

$2(x+4) = 20$

$x + 4 = 10$

$x = 6$

47.) $3ax - a^2 = 2a^2 - 3ab$

$3ax = 3a^2 - 3ab$

$x = a - b$

48.) $7 + 3x + 5 = 2x + 30 - 5x$

$3x + 12 = -3x + 30$

$6x = 18$

$x = 3$

49.) $3x - 5 + 7x = 4 + 5x + 16$

$10x - 5 = 5x + 20$

$5x = 25$

$x = 5$

50.) $7(6x-15) = 13(2x-5)$

$42x - 105 = 26x - 65$

$42x - 26x = 105 - 65$

$16x = 40$

$x = \frac{5}{2}$

58.) Drugi način:

$7(6x-15) = 13(2x-5)$

$7[3(2x-5)] = 13(2x-5)$

$21(2x-5) = 13(2x-5)$

Ova jednadžba opijeli pamo mola, ako je $2x-5=0$. Iz toga slijedi $x = \frac{5}{2}$

51.) $3(3x-4) - 5x - 4(12-3x) = 14x$

$9x - 12 - 5x - 48 + 12x = 14x$

$9x - 5x + 12x - 14x = 12 + 48$

$2x = 60$

$x = 30$

52.) $5(4x-3) + 8(7-9x) = -11$

$20x - 15 + 56 - 72x = -11$

$20x - 72x = -11 + 15 - 56$

$52x = 52 \; ; \; x = 1$

53.) $(2x-3)(5x-4) = (x-2)(4x-6)$

$10x^2 - 15x - 8x + 12 = 4x^2 - 8x - 6x + 12$

$10x^2 - 15x - 8x - 4x^2 + 8x + 6x = 12 - 12 = 0$

$6x^2 - 9x = 0$

$6x - 9 = 0 \; ; \; x = \frac{3}{2}$

54.) $5(x-8) = (x+3)(x-9) - (x+2)(x-10)$

$5x - 40 = x^2 + 3x - 9x - 27 - x^2 - 2x + 10x + 20$

$3x = 33 \; ; \; x = 11$

55.) $(m-2)(x-2) + (m-1)x = (m-1)(2x-3)$

$mx - 2x - 2m + 4 + mx - 1 = 2mx - 2x - 3m + 3$

$-x = -m - 1 \; ; \; x = m + 1$

56.) $\frac{6}{x} = 3$

$\frac{2}{x} = 1$

$x = 2$

57.) $\frac{7}{x} = 7$

$\frac{1}{x} = 1$

$x = 1$

58.) $\frac{28}{x} = 7$

$\frac{4}{x} = 1$

$x = 4$

59.) $\frac{a+b}{x} = 1$

$x = a + b$

60.) $\frac{m+n}{x} = m+n$

$\frac{1}{x} = 1$

$x = 1$

61.) $\frac{18a^2}{x} = 6a$

$\frac{3a}{x} = 1$

$x = 3a$

62.) $\frac{a^2 - b^2}{x} = a + b$

$\frac{a-b}{x} = 1$

$x = a - b$

63.) $\frac{8}{x-1}=2$

$\frac{4}{x-1}=1$

$x-1=4$

$x=5$

64.) $\frac{12}{7-x}=4$

$\frac{3}{7-x}=1$

$7-x=3$

$x=7-3=4$

65.) $\frac{14}{x+2}=3\frac{1}{2}$

$\frac{14}{x+2}=\frac{7}{2}$

$\frac{2}{x+2}=\frac{1}{2}$

$x+2=4$

$x=2$

66.) $\frac{3}{x}-8=4-\frac{1}{x}$

$\frac{3}{x}+\frac{1}{x}=4+8$

$\frac{4}{x}=12$

$\frac{1}{x}=3$

$1=3x$

$x=\frac{1}{3}$

67.) $\frac{8}{x}+3=6-\frac{4}{x}$

$\frac{8}{x}+\frac{4}{x}=6-3$

$\frac{12}{x}=3$

$\frac{4}{x}=1$

$x=4$

68.) $\frac{8}{x}+7+\frac{11}{x}=5+\frac{6}{x}+3$

$\frac{8}{x}+\frac{11}{x}-\frac{6}{x}=5+3-7$

$\frac{13}{x}=1$

$x=13$

69.) $\frac{9}{x-2}+9=14-\frac{6}{x-4}$

Jednadžba je razješonito kvadratična te potome ne spada ovamo.

70.) $\frac{5}{x-3}-10-\left(\frac{9}{x-3}-9\right)=3-\frac{10}{x-3}$

$\frac{5}{x-3}-10-\frac{9}{x-3}+9=3-\frac{10}{x-3}$

$\frac{5}{x-3}-\frac{9}{x-3}+\frac{10}{x-3}=3+10-9$

$\frac{6}{x-3}=4$

$6=4x-12\ ;\ 4x=18\ ;\ x=\frac{9}{2}$

71.) $\frac{x}{5}+\frac{6}{5}=\frac{11}{5}\ /5$

$x+6=11$

$x=5$

Brojem iza crte treba cijelu jednadžbu pomnožiti.

72.) $\frac{2x}{7}-\frac{3}{7}=\frac{11}{7}-\frac{5x}{7}\ /7$

$2x-3=11-5x$

$7x=14\ ;\ x=2$

73.) $\frac{x}{a+b}=\frac{5}{a+b}+\frac{2x}{a+b}\ /(a+b)$

$x=5+2x$

$x-2x=5$

$x=-5$

74.) $\frac{13}{67}-\frac{x}{67}=\frac{8}{67}\ /67$

$13-x=8$

$x=5$

75.) $\frac{5+x}{3}-\frac{7x}{3}=\frac{x+8}{3}\ /3$

$5+x-7x=x+8$

$-7x=3\ ;\ x=-\frac{3}{7}$

76.) $\frac{5x}{(a+b)m}=\frac{10}{(a+b)m}\ /(a+b)m$

$5x=10$

$x=2$

77.) $5-\frac{x}{3}=2$

$\frac{x}{3}=3$

$x=9$

78.) $\frac{x}{6}-2=3$

$\frac{x}{6}=5$

$x=30$

79.) $2x-\frac{3}{4}=\frac{x}{2}\ /4$

$8x-3=2x$

$6x=3$

$x=\frac{1}{2}$

80.) $\frac{3x-5}{2}=5$

$3x-5=10$

$3x=15$

$x=5$

81.) $\frac{3-x}{2}=\frac{x}{4}\ /4$

$2(3-x)=x$

$6-2x=x$

$3x=6$

$x=2$

82.) $\frac{4-3x}{5}=\frac{7}{10}\ /10$

$2(4-3x)=7$

$8-6x=7$

$6x=1$

$x=\frac{1}{6}$

83.) $\frac{2x+1}{2}=\frac{7x+5}{8}\ /8$

$4(2x+1)=7x+5$

$8x+4=7x+5$

$x=1$

84.) $\frac{x}{2}+\frac{x}{7}=7\ /14$

$7x+2x=98$

$9x=98$

$x=\frac{98}{9}$

85.) $\frac{x}{2}-\frac{x}{3}=5\ /6$

$3x-2x=30$

$x=30$

86.) $\frac{x}{3}-4=\frac{3-x}{6}\ /6$

$2x-24=3-x$

$3x=27\ ;\ x=9$

87.) $\frac{x}{a}-\frac{x}{3a}=b\ /3a$

$3x-x=3ab$

$2x=3ab$

$x=\frac{3ab}{2}$

88.) $\frac{x}{m} - n = x/m$

$x - mn = mx$

$x - mx = mn$

$x(1-m) = mn$

$x = \frac{mn}{1-m}$

89.) $\frac{x-a}{b} = \frac{x-b}{a} \quad /ab$

$ax - a^2 = bx - b^2$

$ax - bx = a^2 - b^2$

$x(a-b) = a^2 - b^2$

$x = a + b$

90.) $\frac{2x-m}{2} = \frac{2x-2}{m} \quad /2m$

$2mx - m^2 = 4x - 4$

$2mx - 4x = m^2 - 4$

$2x(m-2) = m^2 - 4$

$2x = m + 2$

$x = \frac{m+2}{2}$

91.) $21 - \frac{7x+3}{4} = 15/4$

$84 - 7x - 3 = 60$

$7x = 21$

$x = 3$

92.) $2 - \frac{x-3}{4} = \frac{x}{7} \quad /28$

$56 - 7x + 21 = 4x$

$11x = 77$

$x = 7$

93.) $\frac{x-3}{2} - \frac{2x-3}{6} = 1/6$

$3x - 9 - 2x + 3 = 6$

$x = 12$

94.) $3 - \frac{x-2}{3} = \frac{4x+7}{5} \quad /15$

$45 - 5x + 10 = (4x+7)3$

$17x = 34$

$x = 2$

95.) $\frac{x+1}{5} + 3 = \frac{2x-3}{3} \quad /15$

$3x + 3 + 45 = 10x - 15$

$7x = 63$

$x = 9$

96.) $x - \frac{4-x}{3} = \frac{1-x}{2} \quad /6$

$6x - 8 + 2x = 3 - 3x$

$11x = 11$

$x = 1$

97.) $\frac{x}{2} + \frac{x}{3} - \frac{x}{4} = \frac{1}{2} \quad /12$

$6x + 4x - 3x = 6$

$7x = 6$

$x = \frac{6}{7}$

98.) $x - 7 = \frac{x}{5} + \frac{x}{3} \quad /15$

$15x - 105 = 3x + 5x$

$7x = 105$

$x = 15$

99.) $x + \frac{3x-5}{2} = 12 - \frac{2x-4}{3} \quad /6$

$6x + 9x - 15 = 72 - 4x + 8$

$19x = 95$

$x = 5$

100.) $\frac{5y-3}{7} + \frac{13-y}{7} = y - 7 \quad /7$

$5y - 3 + 13 - y = 7y - 49$

$3y = 59 \; ; \; y = \frac{59}{3}$

101.) $\frac{2x-7}{6} + \frac{43x}{7} = 2\frac{1}{7} - \frac{x}{7} \quad /42$

$14x - 49 + 258x = 90 - 6x$

$278x = 139$

$x = \frac{1}{2}$

102.) $\frac{5y-1}{2} - 6\frac{3}{5} = \frac{7y-2}{10} - \frac{y}{2} \quad /10$

$25y - 5 - 66 = 7y - 2 - 5y$

$23y = 69$

$y = 3$

103.) $\frac{3z+7}{14} - \frac{2-z}{6} = \frac{z-7}{21} \quad /42$

$9z + 21 - 14 + 7z = 2z - 14$

$14z = -21$

$z = -\frac{3}{2}$

104.) $29 - \frac{35-7x}{7} = 83 - \frac{5x+29}{8}$

$\frac{5x+29}{8} - \frac{35-7x}{7} = 54$

$\frac{5x+29}{8} - 5 + x = 54$

$\frac{5x+29}{8} + x = 59 \quad /8$

$5x + 29 + 8x = 472$

$13x = 443$

$x = \frac{443}{13} = 34\frac{1}{13}$

105.) $\frac{x}{3}+5+\frac{x+3}{5}=x-5+\frac{x}{4}+\frac{x-2}{5}$

$\frac{x}{3}+\frac{x+3}{5}-\frac{x-2}{5}-x-\frac{x}{4}=-10$

$\frac{x}{3}-x-\frac{x}{4}+\frac{x+3-x+2}{5}=-10$

$\frac{x-3x}{3}-\frac{x}{4}+1=-10$

$-\frac{2x}{3}-\frac{x}{4}=-11 \;/(-12)$

$8x+3x=132$

$11x=132\;;\; x=12$

106.) $\frac{x}{2}-3+\frac{x}{6}+x=\frac{x-3}{3}+\frac{x-5}{7}+13$

$\frac{x}{2}+\frac{x}{6}+x-\frac{x-3}{3}-\frac{x-5}{7}=13+3=16\;/42$

$21x+7x+42x-14x+42-6x+30=672$

$64x=614$

$x=\frac{307}{32}$

107.) $\frac{x-1}{2}+\frac{x+4}{3}+2x-5=\frac{5x-7}{2}+\frac{x+5}{5}\;/30$

$15x-15+10x+40+60x-150=75x-105+6x+30$

$15x+10x+60x-75x-6x=-105+30+150-40+15$

$4x=50\;;\; x=\frac{25}{2}$

108.) $\frac{x}{3a}+a-b=\frac{2x}{a}-4a-\frac{bx}{3a^2}$

$\frac{x}{3a}-\frac{2x}{a}+\frac{bx}{3a^2}=-4a-a+b=-5a+b\;/3a^2$

$ax-6ax+bx=-15a^3+3a^2b$

$bx-5ax=3a^2(b-5a)$

$x(b-5a)=3a^2(b-5a)\quad x=3a^2$

109.) $\frac{x}{m}-\frac{x}{n}=3n-3m$

$\frac{nx-mx}{mn}=3n-3m$

$\frac{x(n-m)}{mn}=3(n-m)$

$x=3mn$

110.) $\frac{x}{a^2}-a^2=b^2-\frac{x}{b^2}$

$\frac{x}{a^2}+\frac{x}{b^2}=a^2+b^2$

$\frac{b^2x+a^2x}{a^2b^2}=a^2+b^2$

$\frac{x(a^2+b^2)}{a^2b^2}=a^2+b^2$

$x=a^2b^2$

111.) $\frac{x+7}{x}=2$

$x+7=2x$

$x=7$

112.) $\frac{2x-1}{x-4}=3$

$2x-1=3x-12$

$x=11$

113.) $\frac{x-5}{x}=\frac{1}{2}$

$2x-10=x$

$x=10$

114.) $\frac{7}{x}=\frac{13}{x+2}$

$7x+14=13x$

$6x=14\;;\; x=\frac{7}{3}$

115.) $\frac{7}{x}+1=\frac{4-3x}{2x}$

$\frac{7+x}{x}=\frac{4-3x}{2x}$

$7+x=\frac{4-3x}{2}$

$14x+2x=4-3x$

$5x=-10$

$x=-2$

116.) $\frac{7}{x}-\frac{3}{4}=2-\frac{4}{x}\;/4x$

$28-3x=8x-16$

$11x=44$

$x=4$

117.) $\frac{1}{2x}-\frac{4}{3}+\frac{2}{5x}=\frac{1}{6}\;/30x$

$15-40x+12=5x$

$45x=27$

$5x=3\;;\; x=\frac{3}{5}$

118.) $\frac{3x+5}{x+15}=\frac{7}{5}$

$5(3x+5)=7(x+15)$

$15x+25=7x+105$

$8x=80\;;\; x=10$

119.) $\frac{5x-7}{2x+7}=1\frac{1}{3}$

$\frac{5x-7}{2x+7}=\frac{4}{3}$

$15x-21=8x+28$

$7x=49\;;\; x=7$

120.) $\frac{10}{x}=\frac{24}{x+7}$

$10x+70=24x$

$14x=70$

$x=5$

121.) $\frac{9}{x-8}=\frac{21}{x-4}$

$\frac{3}{x-8}=\frac{7}{x-4}$

$3x-12=7x-56$

$4x=44\;;\; x=11$

122.) $\frac{7}{24-x}=\frac{5}{x-12}$

$7x-84=120-5x$

$12x=204$

$x=17$

123.) $\frac{11}{x-7} = \frac{9}{2x-1}$

$22x-11 = 9x-63$

$13x = -52$

$x = -4$

124.) $\frac{-3}{x+17} = \frac{7}{x+17}$

Jednadžba vrijedi samo, ako je $x+17=0$; $x=-17$

125.) $\frac{5}{x-2} = \frac{2}{x-5}$

$5x-25 = 2x-4$

$3x = 21$

$x = 7$

126.) $\frac{5x+3}{x-1} + \frac{x-3}{2x-2} = 6 \,/\, 2(x-1)$

$10x+6+x-3 = 12x-12$

$x = 15$

127.) $\frac{2x}{x-4} + \frac{2x-5}{x-3} = 4 \,/\, (x-4)(x-3)$

$2x^2-6x+2x^2-8x-5x+20 = 4x^2-28x+48$

$9x = 28$; $x = \frac{28}{9}$

128.) $\frac{x}{x+1} - \frac{3x}{x+2} = -2 \,/\, (x+1)(x+2)$

$x^2+2x-3x^2-3x = -2x^2-6x-4$

$5x = -4$; $x = -\frac{4}{5}$

129.) $\frac{3}{x} - \frac{2}{x+1} = \frac{5}{4(x+1)} \,/\, 4x(x+1)$

$3 \cdot 4(x+1) - 2 \cdot 4x = 5x$

$12x+12-8x = 5x$ $\quad x = 12$

130.) $(x-2)(x-1) = (x-4)(x+4)$

$x^2-3x+2 = x^2-16$

$3x = 18$; $x = 6$

131.) $(2x+3)(x-5) = (x-3)(2x-4)$

$2x^2-7x-15 = 2x^2-10x+12$

$3x = 27$; $x = 9$

132.) $(5x+2)^2 = (3x-1)^2 + (4x+3)^2$

$25x^2+20x+4 = 9x^2-6x+1+16x^2+24x+9$

$2x = 6$; $x = 3$

133.) $(17x-3)^2 - (8x+4)^2 = (15x+1)^2$

$289x^2-102x+9-64x^2-64x-16 = 225x^2+30x+1$

$196x = -8$; $x = -\frac{49}{2}$

134.) $(13x-2)^2-(12x-24)^2 = (3x+19)^2+(4x+9)^2$

$169x^2-52x+4-144x^2+576x-576 = 9x^2+114x+361+16x^2+72x+81$

$338x = 1014$; $x = 3$

135.) $\frac{x+3}{x-5} = \frac{x+6}{x-4} \,/\, (x-5)(x-4)$

$x^2-x-12 = x^2+x-30$

$2x = 18$; $x = 9$

136.) $\frac{x+9}{x-6} = \frac{x+17}{x-4} \,/\, (x-6)(x-4)$

$x^2+5x-36 = x^2+11x-102$

$6x = 66$; $x = 11$

137.) $\frac{3x+5}{x-1} = \frac{3(2x+7)}{2x-1} \,/\, (x-1)(2x-1)$

$6x^2+7x-5 = 6x^2+15x-21$

$8x = 16$; $x = 2$

138.) $x : 2\frac{1}{3} = 15 : 7$

$x : \frac{7}{3} = 15 : 7$

$x : 1 = 15 : 3$

$x = 5$

139.) $2 : 5 : 4 = x : \frac{2}{5}$

$25 : 40 = x : \frac{2}{5}$

$1 : 8 = x : 2$

$x = \frac{1}{4}$

140.) $3x : (4x-1) = 4 : 5$

$15x = 16x-4$

$x = 4$

141.) $(7x-3) : (3x-2) = 5 : 2$

$5(3x-2) = 2(7x-3)$

$15x-10 = 14x-6$

$x = 4$

142.) $(3x-16) : 1 = (4x-3) : 5$

$4x-3 = 15x-80$

$11x = 77$

$x = 7$

143.) $(x+5) : 7 = (x-5) : 5$

$7x-35 = 5x+25$

$2x = 60$

$x = 30$

144.) $(5x+1) : (3x+2) = 3 : 2$

$9x+6 = 10x+2$

$x = 4$

145.) $(x+7):(2x+3)=(x-1):(2x-9)$

$(x-1)(2x+3)=(2x-9)(x+7)$

$2x^2+x-3=2x^2+5x-63$

$4x=60\ ;\ x=15$

146.) $(x+0{\cdot}75):x=(x+\frac{1}{4}):(x-0{\cdot}25)$

$x(x+0{\cdot}25)=(x-0{\cdot}25)(x+0{\cdot}75)$

$x^2+0{\cdot}25x=x^2+0{\cdot}50x-0{\cdot}1875$

$0{\cdot}25x=0{\cdot}1875\ ;\ x=0{\cdot}75$

147.) $(x-a):(x-a+5)=(x-5):(x+5)$

$(x-a)(x+5)=(x-a+5)(x-5)$

$x^2-ax+5x-5a=x^2-ax+5x-5x+5a-25$

$15x=10a-25\ ;\ x=\frac{2a-5}{3}$

148.) $\frac{35+8x}{3x}-4=\frac{31-5x}{4x}\ /12x$

$140+32x-48x=93-15x$

$x=47$

149.) $\frac{12x+5}{4}+\frac{8x-3}{5x+2}=\frac{9x+7}{3}\ /12(5x+2)$

$3(5x+2)(12x+5)+12(8x-3)=4(5x+2)(9x+7)$

$3(60x^2+49x+10)+96x-36=4(45x^2+53x+14)$

$180x^2+147x+30+96x-36=180x^2+212x+56$

$31x=62\ ;\ x=2$

150.) $\frac{3x+1}{2x-1}-\frac{3x-1}{2x+1}=\frac{4x-25}{4x^2-1}\ /(4x^2-1)$

$(3x+1)(2x+1)-(3x-1)(2x+1)=4x-25$

$6x^2+5x+1-6x^2+5x-1=4x-25$

$6x=-25\ ;\ x=-\frac{25}{6}$

151.) $\frac{11x+8}{x+3}-\frac{62}{x^2-9}=\frac{11x+6}{x-3}\ /(x^2-9)$

$(11x+8)(x-3)-62=(11x+6)(x+3)$

$11x^2-25x-24-62=11x^2+39x+18$

$64x=-104\ ;\ x=-\frac{13}{8}$

152.) $7(\frac{x}{x+2}-1)=8(\frac{x}{x+1}-1)$

$\frac{7[x-(x+2)]}{x+2}=\frac{8[x-(x+1)]}{x+1}$

$\frac{-14}{x+2}=\frac{-8}{x+1}$

$7(x+1)=4(x+2)$

$7x+7=4x+8$

$3x=1\ ;\ x=\frac{1}{3}$

153.) $4(\frac{2z-7}{3}-2)=6(\frac{z+1}{3}-2)$

$\frac{2[(2z-7)-6]}{3}=\frac{3(z+1-6)}{3}\ /3$

$4z-26=3z-15$

$z=11$

154.) $8(5+3x)+\frac{3(5+3x)}{11}-80=\frac{5+3x}{2}+\frac{11}{2}$

$8u+\frac{3u}{11}-80=\frac{u}{2}+\frac{11}{2}\ /22$

$176u+6u-1760=11u+121$

$171u=1881\ ;\ u=11$

Dakle je $5+3x=11\ ;\ x=2$

155.) $4(x+3)-3(x+3)-2(x+3)+4=0$

$-(x+3)+4=0$

$x+3=4\ ;\ x=1$

156.) $2-\frac{5+x}{7}=1-\frac{9-x}{14}\ /14$

$28-10-2x=14-9+x$

$3x=13\ ;\ x=\frac{13}{3}$

157.) $3=12-\frac{47-\frac{60}{x}}{3}\ /3$

$9=36-47+\frac{60}{x}$

$\frac{60}{x}=20\ ;\ x=3$

158.) $12-\frac{67-\frac{60}{z}}{4}=4\ /4$

$48-67+\frac{60}{z}=16$

$\frac{60}{z}=35\ ;\ z=\frac{12}{7}$

159.) $3-\left(\frac{4+y}{3}-\frac{6+y}{7}\right)=\frac{8+y}{9}-10 \mid 63$

$189-21(4+y)+9(6+y)=7(8+y)-630$

$189-84-21y+54+9y=56+7y-630$

$19y=733;\ y=\frac{733}{19}$

160.) $\frac{a}{bx}+\frac{b}{ax}=a^2+b^2 \mid abx$

$a^2+b^2=abx(a^2+b^2)$

$abx=1;\ x=\frac{1}{ab}$

161.) $\frac{a}{x}=\frac{b}{b+x} \mid x(b+x)$

$ab+ax=bx$

$x(b-a)=ab\ ;\ x=\frac{ab}{b-a}$

162.) $(a-x)(b-x)=x^2$

$ab-bx-ax+x^2=x^2$

$ax+bx=ab$

$x(a+b)=ab;\ x=\frac{ab}{a+b}$

163.) $\frac{a-y}{2b-y}=\frac{2a+y}{b+y} \mid (2b-y)(b+y)$

$ab-by+ay-y^2=4ab-2ay+2by-y^2$

$3ay-3by=3ab$

$y=\frac{ab}{a-b}$

164.) $\frac{2x-1}{3}-\frac{5x-4}{6}-\frac{3x-2}{4}=-\frac{6+7x}{12} \mid 12$

$8x-4-10x+8-9x+6=-6-7x$

$-4x=-16;\ x=4$

165.) $\sqrt{x+8}=7$ / kvadriraj!

$x+8=49$

$x=41$

166.) $2\sqrt{x}-3=3$

$2\sqrt{x}=6$

$\sqrt{x}=3;\ x=9$

167.) $\sqrt{3+9x^2}=2-3x$

$3+9x^2=4-12x+9x^2$

$12x=1;\ x=\frac{1}{12}$

168.) $5=3\sqrt{x}-5$

$100=9x$

$x=\frac{100}{9}$

169.) $\sqrt{36+x}=18+\sqrt{x}$

$36+x=324+36\sqrt{x}+x$

$36\sqrt{x}=-288$

$\sqrt{x}=-8;\ x=64$

170.) $\sqrt{4x^2-7x-6}=9-2x$

$4x^2-7x-6=81-36x+4x^2$

$29x=87$

$x=3$

171.) $\sqrt{x+12}=4\sqrt{x-3}$

$x+12=16x-48$

$15x=60$

$x=4$

172.) $\sqrt{\frac{2x+3}{3x-4}}=\frac{1}{2}$

$\frac{2x+3}{3x-4}=\frac{1}{4}$

$8x+12=3x-4$

$5x=-16$

$x=-\frac{16}{5}$

173.) $\sqrt[3]{5x-7}=2\sqrt[3]{x+1}$

$5x-7=8(x+1)$

$5x-7=8x+8$

$3x=-15$

$x=-5$

174.) $\frac{\sqrt{x}}{6}-\frac{\sqrt{x}}{4}=\frac{\sqrt{x}-17}{12}-\frac{5}{4} \mid 12$

$2\sqrt{x}-3\sqrt{x}=\sqrt{x}-17-15$

$2\sqrt{x}=32$

$\sqrt{x}=16;\ x=256$

175.) $2\sqrt{3x}+\frac{3\sqrt{3x}+5}{2}=5+\frac{10\sqrt{3x}-8}{2} \mid 2$

$4\sqrt{3x}+3\sqrt{3x}+5=10+10\sqrt{3x}-8$

$3\sqrt{3x}=3$

$\sqrt{3x}=1;\ x=\frac{1}{3}$

176.) Umetni za x zaporedna pozitivna cela števila, tako da dobiš enačbo po a.

$\frac{2x-a}{x-4}=3$

$\frac{22-a}{11-4}=3$

$22-a=21$

$a=1$

177.) $\frac{x-a}{x}=\frac{1}{2}$ Vidi zad. 176

$\frac{6-a}{6}=\frac{1}{2}$

$12-2a=6$

$2a=6;\ a=3$

178.) $\frac{x-2a}{x+2a} + \frac{x-4a}{x-3a} = 2$ Vidi zad 176

$(x-2a)(x-3a) + (x-4a)(x+2a) = 2(x+2a)(x-3a)$

$x^2 - 5ax + 6a^2 + x^2 - 2ax - 8a^2 = 2x^2 - 2ax - 12a^2$

$5ax = 10a^2$

$x = 2a$; Ako je $x = 1$, onda je $a = \frac{1}{2}$

---

§. 70. Algebarski zadaci.

1.) $x + 15 = 24$

$x = 9$

2.) $x - \frac{x}{3} = 16$

$2x = 48$

$x = 24$

3.) $\frac{x}{5} + 6 = \frac{x}{4}$

$x = 120$

4.) $\frac{7}{x} = 5$

$x = \frac{7}{5}$

5.) $\frac{x}{a+1} = a^2 - a + 1$

$x = (a^2 - a + 1)(a+1)$

$x = a^3 + 1$

6.) $x - 26 = \frac{x}{3}$

$\frac{2x}{3} = 26$

$x = 39$

7.) $(x-3)3 = \frac{x+3}{3}$

$9x - 27 = x + 3$

$x = \frac{15}{4}$

8.) $\frac{x-3}{7} = 6$

$x = 45$

9.) $x - \frac{x}{10} = \frac{x}{2} + 28$

$10x - x = 5x + 280$

$x = 70$

10.) A ima $3x$ ako B ima x

$3x + x = 734$

$x = 183\frac{1}{2}$

A ima $550\frac{1}{2}$

11.) $2x + 30 = 300$

$x = 135$

12.) Sada ima x g

$\frac{x+20}{2} = x - 5$

$x + 20 = 2x - 10$

$x = 30$

13.) Ako sin ima sada x g ima otac $3x$ g

Prije 12 g otac $(3x-12)$ g a sin $(x-12)$ g

$3x - 12 = 9(x-12)$; $x = 16$ g

14.) $\frac{224}{2x} + 28 = \frac{224}{x}$

$224 + 56x = 448$

$x = 4$ osobe

15.) $\frac{58-x}{14} = 32 - x$

$58 - x = 448 - 14x$

$13x = 390$; $x = 30$ g

16.) Ako B pada ima x g ima A $2x$ g

Prije 7 g imao je B $(x-7)$ g a A $(2x-7)$

$(x-7) + (2x-7) = 2x$

$3x - 14 = 2x$

$x = 14$ g ima B, a A 28 g

17.) Djete ima x, mati $(x+25)$ a otac $(x+30)$ g

$x + (x+25) + (x+30) = 91$

$3x + 55 = 91$

$x = 12$ godina ima dijete, mati 37, a otac 42.

18.) Dječaka je bilo x

$8x = 7(x+4)$

$8x = 7x + 28$

$x = 28$

19.) Dan ima x sati, a noć $(x+13)$ sati.

$x + x + 13 = 24$

$x = 5\frac{1}{2}$ h

20.) Jabuka je bilo x, a krušaka $120 - x$

Za jabuke je dobila $\frac{x}{7} \cdot 20$, a za kruške $\frac{120-x}{5} \cdot 18$

$\frac{x}{7} \cdot 20 + \frac{120-x}{5} \cdot 18 = 380$

$100x + (840 - 7x)18 = 13300$

$26x = 1820$

$x = 70$ jabuka ; krušaka je bilo $120 - 70 = 50$

21.) Jedan radnik zaslužio x K

$8x - 20 = 6x$

$x = 10$ K

22.) Žena je bilo x, a Gnoli 3x. Kasl ode 8 osoba jima (x-4) žena i 4(x-4) čovjeka.

$x+3x-8=x-4+4(x-4)$

$4x-8=5x-20$

$x=12$ žena, 36 Gnoli.

23.) $\frac{3-x}{4-x}=\frac{2}{5}$

$15-5x=8-2x$

$x=\frac{7}{3}$

24.) Dvoznamenkasti je broj $10x+(10-x)$; jedna je znamenka x, a druga $(10-x)$

$[10x+(10-x)]2-1=10(10-x)+x$

$18x+19=100-9x$

$x=3$; $10-x=7$

Traženi je broj 37

25.) Broj je broj $20x+x=84$

$20x+x+10x+2x=132$

$33x=132$

$x=4$

26.) $300+10x+8+270=100x+38$

$90x=540$; $x=6$

27.) Broj je broj $x=213.7+1=1492$

28.) Pogledaj uputu u knjizi.

$10x+2=3(200000+x)$

$7x=599998$ Traženi je

$x=85714$. broj 857142

29.) 1 jabuka stoji x h. 24 jabuke stoje 24x h

On jima dakle $(24x+15)$ h ili $(30x-21)$ h

$24x+15=30x-21$

$x=6$ h stoji 1 jabuka

A jima $24.6+15=159$ h $=1.59$ K

30.) Jedan šegrt dobivao x

" pomoćnik " 3x

$5.3x+8x=27.60$

$x=120$ K dobije svaki šegrt, a 360 svaki pomoćnik

31.) Dobrih je zadataka bilo x. Sin je dobio za njih 20.x h. Loših je bilo 20-x

Morao je dakle otac platiti $(20-x)20$ h.

$20x-(20-x)20=160$

$20x-400+20x=160$

$x=14$ dobrih zadataka.

32.) Radio je x dana i dobio za njih 3x K.

Nije radio $(60-x)$ dana i platio gospodaru $(60-x).1$ K.

$3x-(60-x)=48$

$x=27$ dana je radio

33.) Druga jima x, a prva $\frac{3}{4}x$

$x+\frac{3}{4}x=14$ l

$x=8$ l jima druga posuda.

Prva jima $\frac{3}{4}.8=6$ l.

34.) Ako brat jima x braće ima sestra $(x+1)$ brata. Ako sestra jima y sestara ima brat $(y+1)$ sestru.

$y=\frac{x+1}{2}$

$x=y+1$ ili $y=x-1$

$2y=x+1$

$2(x-1)=x+1$ Bile su 3 djevojčice

$x=3$ i 4 dječaka.

35.) Sastati će se iza x sati. Prva osoba prevali za to vrijeme $\frac{21}{2}x$ km, a druga $\frac{35}{4}x$ km

$$\frac{21}{2}x + \frac{35}{4}x = 1078\,km$$

$$x = 56 \text{ sati}$$

Prva će osoba prevaliti put od $\frac{21}{2} \cdot 56 = 588$ km

36.) Sastati će se iza x sati odkako je brzi vlak pošao iz A. Brzi je vlak za to vrijeme prevalio $\frac{1}{3\frac{1}{2}}x$ puta između A i B. Osobni vlak ide 1 sat manje t.j: $(x-1)$ sati i prevali za to vrijeme $\frac{1}{5\frac{1}{4}}(x-1)$ puta između A i B. Suma tih putova = je cio put = 1

$$\frac{x}{3\frac{1}{2}} + \frac{x-1}{5\frac{1}{4}} = 1\,; \quad x = 2 \cdot 5^h$$

Sastanu se u $8\frac{1}{2}$ sati.

37.) Sastati će se iza x minuta iza kako je pošao prvi pješak. Prvi će pješak za to vrijeme prevaliti put od $60.x$ m. Drugi pješak ide 10 minuta manje i prevali za to vrijeme $(x-10)75$ m.

$$60x = (x-10)75$$

$x = 50$ minuta iza kako je pošao prvi pješak.

Udaljenost = $50.60 = 3000$ m $= 3$ Km.

38.) Konjenik će stići pješaka x sati iza kako je pješak pošao. Konjenik je trebao da ga stigne $(x-7)$ sati.

$$x : (x-7) = 12 : 5$$

$$x = 12$$

Konjenik će dakle jahati $12-7 = 5^h$ do. dostigne pješaka

39.)

A će prevaliti do mjesta C gdje će ga B dostići $15-6 = 9$ Km (Od 5^h u jutro do 8^h na veče ima 15^h) B ima da prevali do C $9+15 = 105$ Km i to mora da prevali za 15 sati. Za 1 sat mora da prevali x km.

$$15x = 135\,; \quad x = 7 \text{ km na sat.}$$

40.) Brzina velike kazaljke odnosi se prema brzini male kazaljke kao 12:1 Ako mala kazaljka prevali x minuta prevali velika da se pokriju $(60+x)$ minuta.

$$(60+x) : x = 12 : 1$$

$$x = \frac{60}{11} = 5\frac{5}{11} \text{ min.}$$

Minuta je tu uzeta kao put t.j: 60 tih dio kruga. Kazaljke će se dakle pokrivati u $1\frac{5}{11}{}^h$ iza podne, jer mala kazaljka prevali 5 min. puta za 1^h

41.) Mala kazaljka stoji x minuta puta (Vidi zad 40) dalje od 3^h. Velika kazaljka stoji $x+15$ minuta puta dalje od 3^h.

$$(x+15) : x = 12 : 1$$

$$x = \frac{15}{11} = 1\frac{4}{11} \text{ min. puta}$$

Velika kazaljka stoji $15 + 1\frac{4}{11} = 16\frac{4}{11}$ minuta puta dalje od 3^h, pokazuje dakle $3^h + 15 + 16\frac{4}{11} = 3^h\, i\, 31\frac{4}{11}$ min.

42.) $120° = \frac{1}{3}$ kruga $= 20$ min puta.

Mala kazaljka prevali x minuta puta (Vidi zad. 40) će 9^h, a velika $x+20$ min. puta. $(x+20) : x = 12 : 1$

$$x = \frac{20}{11} = 1\frac{9}{11} \text{ min. puta.}$$

(Nastavak na drugoj str.)

43.) Kroz obe cijevi napuni se za $1^h \frac{1}{x}$ posude. Kroz jednu cijev napuni se za $1^h \frac{1}{20}$ posude. Kroz drugu se napuni dakle za $1^h \frac{1}{x} - \frac{1}{20} = \frac{1}{30}$ posude. Druga cijev treba potome 30 sati da napuni posudu.

44.) Kroz 1 cijev ispuni se za $1^h \frac{1}{5}$ posude, a kroz drugu isprazni $\frac{1}{6}$ posude. U posudi ostane iza jednog sata $\frac{1}{5} - \frac{1}{6} = \frac{1}{30}$ posude pune vode. Posuda će biti puna za 30 sati.

45.) Kroz cijev A uteče za $1^h \frac{1}{3}$ posude, a kroz cijev B $\frac{1}{6}$ posude. Iza 1 sata ima $\frac{1}{3} + \frac{1}{6} = \frac{1}{2}$ posude pune vode. Za 1 sat uteče kroz cijev C $\frac{1}{7}$ posude. Iza jednog sata ima u istinu $\frac{1}{2} - \frac{1}{7} = \frac{5}{14}$ posude pune vode. Posuda će biti puna iza $\frac{14}{5} = 2\frac{4}{5}$ sata.

46.) Ako obojica zajedno trebaju x dana da obave posao, što popše za 1 dan $\frac{1}{x}$ posla. A popši za 1 dan $\frac{1}{8}$ posla, a B $\frac{1}{10}$ posla.

$\frac{1}{x} = \frac{1}{8} + \frac{1}{10}$

$x = 4\frac{4}{9}$ dana.

47.) A popši za 1 dan $\frac{1}{12}$ posla. Ako B sam treba x dana, što popši za 1 dan $\frac{1}{x}$ posla. Obojica zajedno popše za 1 dan $\frac{1}{4}$ posla.

$\frac{1}{12} + \frac{1}{x} = \frac{1}{4}$; $x = 6$ dana treba B.

B je bolji radnik.

48.) Platio je x K

$x + \frac{8x}{100} = 1{\cdot}35$

$x = 1{\cdot}25$ K platio

49.) Trgovca stoji 1 kg x h

$x - \frac{12x}{100} = 66$

$x = 75$ h

je trgovac za 1 kg

50.) Zadatak je neosnovan.

51.) x l po 96 h, a $(160-x)$ l po 128 h

$96x + (160-x)128 = 160 \cdot 108$

52.) Treba dodati x litara vode po 80 h

$25 \cdot 32 + x \cdot 80 = (25+x) \cdot 70$

53.) Izvedi jednadžbu na temelju računa prijese.

54.) Vidi zad. 53.

55.) Prije je dobivao svaki radnik 3 K na dan. Ako sada dobiva svaki od x radnika 4 K na dan, a gospodar isplaćuje dnevno 240 K, to je $4x = 240$, a $x = 60$ radnika je ostalo. Otpuštenih je 20.

56.) Gospodar će oduzeti sluzi $\frac{5}{12}$ prijednosti odbijela od $\frac{7}{12}$ njegove godišnje zaslužbe, ja odlazi 5 mjeseci prije kraja godine.

$\frac{160 \cdot 7}{12} - \frac{5x}{12} = 42{\cdot}80$; $x = 121{\cdot}48$ K je računano za odbijelo.

57.) Prije je bilo x radnika od kojih je svaki dobivao a K. Dnevni izdatak iznosio je ax K. Kad je otpušteno 140 radnika, dobiva svaki $a - \frac{15a}{100}$, a dnevni izdaci iznose $(x-140)(a - \frac{15a}{100}) =$

$= (x-140)\,a\left(1-\frac{15}{100}\right)K$. Tri puta jednaki polovici prijašnjih izdataka.

$$\frac{ax}{2} = (x-140)\cdot a\left(1-\frac{15}{100}\right)$$

$$\frac{x}{2} = (x-140)\,\frac{100-15}{100}$$

$x = 340$ radnika je prije bilo.

58.) Imutak $= x\,K$

$$\frac{3}{4}x\cdot 5 + \frac{1}{4}x\cdot 4\frac{1}{2} = 1170$$

$$\frac{15x}{4} + \frac{9x}{8} = 117000$$

$x = 24000\,K$

59.) Kamate kroz 20 godina moraju biti jednaki glavnici.

$$\frac{ax}{100}\cdot 20 = a$$

$x = 5\%$

60.) $x + \frac{x\cdot 5{\cdot}75}{100} = 3798{\cdot}54$

$x = 3592$

61.) Prva je glavnica x, druga $(5330-x)$

$$\frac{5x}{100} = 2\,\frac{(5330-x)}{100}\,/4$$

$5x = 8(5330-x)$

$x = 3280\,K$ je prva glavnica

Druga je $5330-x = 2050\,K$

62.) Za x godina

$$\frac{4400\cdot 5}{100}x + \frac{5500\cdot 4{\cdot}5}{100}x = 1870$$

$220x + 247{\cdot}5x = 1870$

$467{\cdot}5x = 1870$

$x = 4$ godine

63.) Prva je $(x+2000)$, druga x

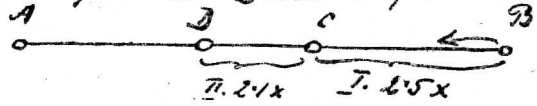
$$\frac{(x+2000)5}{100} = \frac{x\cdot 6}{100}$$

$5x + 10000 = 6x$

$x = 10000$ je druga glavnica.

Prva je $12000\,K$.

64.) Po uputi za zad. 40, 41 i 42.

65.) 

$DB = 40{\cdot}48$

Prvi je dječak trebao da prevali put od A do B $\frac{253}{2{\cdot}5} = 101{\cdot}2$ sek. Njegov drug prevalio je za to vrijeme $101{\cdot}2\cdot 2{\cdot}1 = 212{\cdot}52$ m, te se nalazi u tački D u istom času, kad prvi dječak počne trčati od B prema njemu. Udaljenost $DB = 253 - 212{\cdot}52 = 40{\cdot}48$ m. Dječaci će se sastati u tački C iza x sek.

$2{\cdot}1x + 2{\cdot}5x = 40{\cdot}48$ Dječaci će se sastati

$4{\cdot}6x = 40{\cdot}48$ iza $101{\cdot}2 + 8{\cdot}8 = 110$ sek

$x = 8{\cdot}8$ sek. iza kako su pošli iz A.

66.) A je imao x, a B $(1416-x)\,K$

$$x - \frac{4}{7}x = 1416 - x - \frac{3}{8}(1416-x)$$

$$\frac{3x}{7} = 1416 - x - 531 + \frac{3}{8}x$$

$$\frac{59x}{56} = 885$$

$x = 840\,K$; B ima $1416-840 = 576\,K$

67.) Ako je prvi dio x, onda je drugi $(x-8)$ a treći $(x-16)$

$x + x - 8 + x - 16 = 60$ Prvi je dio 28

$3x - 24 = 60$ drugi 20, a treći 12.

$x = 28$

68.) Jedan iznos x, a drugi $180-x$

$x+23°45' = 180°-x$

$x = 78°7'30''$

Drugi: $78°7'30'' + 23°45' = 101°52'30''$

69.) a) $x:(180-x) = 4:5$ Rezultat u knjizi.

b.) $x:(180-x) = 1\frac{1}{2}:\frac{3}{4}$

70.) Prvi iznos $x°$ drugi $x+12°18'$ a treći $x+12°18'+6°30' = x+18°48'$

$x+x+12°18'+x+18°48' = 180$

Rezultat u knjizi.

71.) Ako je jedan kut na podnici $= x$, onda je kut na vrhu jednak za a.) $2x$

b.) $3x$ c.) $4x$

a.) $x+x+2x = 180$; $x = 45°$; kut na vrhu $= 90°$

b) $x+x+3x = 180$; $x = 36$ " " " $= 108°$

c.) $x+x+4x = 180$; $x = 30$ " " " $= 120°$

slično zaključi ako je kut na vrhu manji.

72.) Izračunaj po formuli $n.180-360 =$ suma prijelaznih kuteva u poligonu.

n označuje broj stranica.

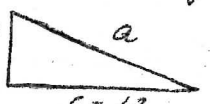
73 i 74. po formulama iz geometrije.

75.) Centrični kut $=$ 2 puta obodni kut.

$x = \frac{x}{2}+24$

$x = 48°$ je centrični kut

76.)



$a+b+c = 30$

$a+b = 30-c = 30-12 = 18$

$b^2 = a^2-12^2$

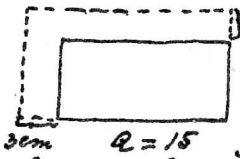
$a+b = 18$

$b = 18-a$

$(18-a)^2 = a^2-12^2$

$a = 13$; $b = 5$

77.)



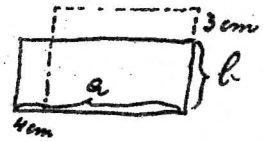
$ax+78 = (a+3)(x+3)$

$15x+78 = 18(x+3)$

$x = 8$

Prijašnja površina pravokutnika $= ax = 15\cdot 8 = 120\ cm^2$

78.)



$2a+2b = 78$

$a+b = 39$

$ab = (a-4)(b+3)$

$ab = ab-4b+3a-12$

$4b = 3a-12$

$b = 39-a$

$b = \frac{3a-12}{4} = 39-a$

$\frac{3a-12}{4} = 39-a$

$7a = 168$

$a = 24$

$b = 15$

79.) Hipotenuza $= x$, druga kateta $= (x-2)$

$x^2 = (x-2)^2+12^2$

$x^2 = x^2-4x+4+144$

$x = 37$

80.) Druga kateta je x

$(x+2)^2 = x^2+8^2$

$x^2+4x+4 = x^2+8^2$

$x = 15$

81.) Podnica je x, krak $(x-11)$

$x+2(x-11) = 53$

$x+2x-22 = 53$

$3x = 75$; $x = 25$; krak $= 14$

82.) Visina na stranicu $a = \frac{2}{a}\sqrt{s(s-a)(s-b)(s-c)}$

" " " $b = \frac{2}{b}\sqrt{s(s-a)(s-b)(s-c)}$

$v_a : v_b = \frac{1}{a}\sqrt{s(s-a)(s-b)(s-c)} : \frac{2}{b}\sqrt{s(s-a)(s-b)(s-c)}$

$v_a : v_c = \frac{1}{a} : \frac{1}{b}$ $v_a = x$

$v_a : v_c = b : a$ $v_c = 27-x$ / Rastavak na drugoj str. /

$x:(27-x)=16:20$

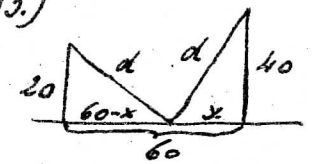
$20x=16(27-x)$

$5x=4(27-x)$

$5x=108-4x$

$9x=108\ ;\ x=12=v_a\ ;\ v_f=15$

83.)



$d=\sqrt{40^2+x^2}$

$d=\sqrt{20^2+(60-x)^2}$

$\sqrt{40^2+x^2}=\sqrt{20^2+(60-x)^2}$

$40^2+x^2=20^2+(60-x)^2$

$1600+x^2=400+3600-120x+x^2$

$120x=4000-1600$

$x=20$

84.) $2r\pi=2r+\frac{\alpha r\pi}{180}$

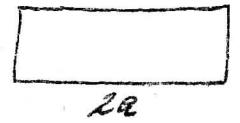
$2\pi=2+\frac{\alpha\pi}{180}$

$360\pi-360=\alpha\pi$

$\alpha=360\left(1-\frac{1}{\pi}\right)$

Opseg sektora $=2r+l=2r+\frac{\alpha r\pi}{180}$

85.)



$(a+1)(2a+1)=2a.a+16$

$2a^2+3a+1=2a^2+16$

$3a=15$

$a=5$

$2a=10$

86.)

$2a+2b=64$

$a+b=32$

$(a-2)(b+4)=ab+66$

$ab-2b+4a-8=ab+66$

$4a-2b=74$

$2a-b=37$

$a+b=32$ } +

$3a=69$

$a=23\ ;\ b=9$

87.)

$2a_1+2b_1=\frac{2a+2b}{2}$

$a_1+b_1=\frac{a+b}{2}=\frac{19+15}{2}=17$

$d=\frac{b}{2}-\frac{b_1}{2}=\frac{a}{2}-\frac{a_1}{2}$ /Nastavak na drugoj str../

$b-b_1=a-a_1$

$a_1-b_1=a-b=4$ } +

$a_1+b_1=17$

$2a_1=21$

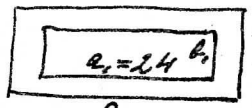
$a_1=10\frac{1}{2}\ ;\ b_1=6\frac{1}{2}$

$d=\frac{a}{2}-\frac{a_1}{2}=\frac{b}{2}-\frac{b_1}{2}$

$d=\frac{15}{2}-\frac{13}{4}=\frac{30-13}{4}$

$d=\frac{17}{4}=4\frac{1}{4}$

88.)



Iz zadatka 87. slijedi:

$a_1-b_1=a-b$

$24-b_1=a-18$

$a+b_1=42$

$b_1=\frac{a}{2}$

$a+\frac{a}{2}=42$

$\frac{3a}{2}=42\ ;\ a=28$

$a_1b_1=\frac{2}{3}ab$

$24b_1=\frac{2}{3}\cdot 18a$

$24b_1=12a$

$2b_1=a$

$b_1=\frac{a}{2}$

§ 71. Jednadžbe prvog stepena sa više nepoznanica

1.) $x+y=5$

$4x-y=5$

$5x=10$

$x=2\ ;$

Metoda jednakih koeficienata

$2+y=5$

$y=3$

2.) $3x+2y=21$

$7x-2y=29$

$10x=50$

$x=5$

$15+2y=21$

$2y=6$

$y=3$

M. j. k

3.) $4x-2y=6$ /-1

$4x+5y=13$

$-4x+2y=-6$

$4x+5y=13$

$7y=7$

$y=1$

$x=2$

M. j. k.

4.) $7x+12y=50 \mid 3$
$5x+9y=37 \mid -4$ M.j. k.
$21x+36y=150$
$-20x-36y=-148$
$x=2$

$14+12y=50$
$12y=36$
$y=3$

5.) $3x+2y=13 \mid 3$
$2x+3y=12 \mid -2$ M.j. k.
$9x+6y=39$
$-4x-6y=-24$
$5x=15$
$x=3$
$y=2$

6.) $5x+3y=18$ Metoda supstitucije
$3y-y=8$
$2y=8;\ y=4$
$5x+12=18$
$5x=6;\ x=\frac{6}{5}$

7.) $8x+5y=34 \mid -3$
$7x+3y=27 \mid 5$ M.j.k.
$-24x-15y=-102$
$35x+15y=135$
$11x=33$
$x=3$
$y=2$

8.) $14x+3y=13 \mid 5$
$18x-5y=-1 \mid 3$ M.j. k
$70x+15y=65$
$54x-15y=-3$
$124x=62$
$x=\frac{1}{2};\ y=2$

9.) $0{\cdot}8x-2{\cdot}1y=3{\cdot}3 \mid 0{\cdot}3$
$1{\cdot}2x+7y=35{\cdot}4$ M.j.k
$0{\cdot}8x-2{\cdot}1y=3{\cdot}3$
$0{\cdot}36x+2{\cdot}1y=10{\cdot}62$
$1{\cdot}16x=13{\cdot}92$
$x=12;\ y=3$

10.) $4\frac{1}{2}x+5\frac{1}{3}y=68$
$2\frac{1}{4}x-2\frac{1}{6}y=5$
$\frac{9}{2}x+\frac{16}{3}y=68 \mid 6$
$\frac{9}{4}x-\frac{13}{6}y=5 \mid 12$
$27x+32y=408$
$54x-26y=60 \mid -1$ M.j. k.
$58y=348$
$y=6;\ x=8$

11.) $\frac{y}{3}+1=x \mid 3$
$\frac{2y}{5}=8-\frac{x}{3} \mid 15$
$y+3=3x$
$6y=120-5x$
$-y+3x=+3$
$6y+5x=120 \mid 6$
$-6y+18x=18$
$6y+5x=120$
$23x=138$
$x=6;\ y=15$

12.) $\frac{x}{3}+\frac{y}{5}=3 \mid 15$
$\frac{7x+4}{5y}=1 \mid 5y$
$5x+3y=45 \mid 5$ M.j.
$7x-5y=-4 \mid 3$ k.
$25x+15y=225$
$21x-15y=-12$
$46x=213$
$x=\frac{213}{46};\ y=\frac{335}{46}$

13.) $3x+4y=53$ M.s.
$x:y=7:8$
$y=\frac{8x}{7}$
$3x+4\cdot\frac{8x}{7}=53$
$21x+32x=371$
$53x=371$
$x=7;\ y=8$

14.) $5x:4y=0{\cdot}75\ldots$ I.
$2x:3y=3:7\frac{1}{2}\ldots$ II.
$\frac{5x}{4y}=\frac{3}{4}\ldots$ I.
$5x=3y\ldots$ I.
$9y=15x\ldots$ II.
$5x=3y\ldots$ II.
Jednadžbe nije moguće pojednostaviti, jer su obje jednake.

15.) $(5x-y):(3x+13)=19:25$
$(3x+4y):(7x-8)=4:5$
$125x-25y=57x+247$
$15x+20y=28x-32$
$68x-25y=247 \mid 4$ M.j.
$13x-20y=32 \mid -5$ k.
$272x-100y=988$
$-65x+100y=-160$
$207x=828$
$x=4;\ y=1$

16.) $x:y=3:5\ldots$ I.
$(x+1):(y+3)=7:13\ldots$ II.
$13x+13=7y+21$
$13x-7y=8\ldots$ I.)
$y=\frac{5x}{3}\ldots$ I. M.s.
$13x-7\cdot\frac{5x}{3}=8$
$39x-35x=24$
$4x=24$
$x=6;\ y=10$

17.) $(x+1):(y-1)=3:2$
$(x-2):(y+2)=2:3$

$2x+2=3y-3$
$3x-6=2y+4$

$2x-3y=-5 \mid \cdot(-2)$
$3x-2y=10 \mid \cdot 3$ M.j. k.

$-4x+6y=10$
$9x-6y=30$

$5x=40$
$x=8;\ y=7$

18.) $(3x+y):(2x+7)=11:13$
$(5x-3y):(3x-14)=9:-5$

$39x+13y=22x+77$
$-25x+15y=27x-126$

$17x+13y=77 \mid \cdot 15$
$52x-15y=126 \mid \cdot 13$ M.j. k.

$255x+195y=1155$
$676x-195y=1638$

$931x=2793$
$x=3;\ y=2$

19.) $\frac{x+3}{y}=\frac{1}{3}$

$\frac{x}{y-1}=\frac{1}{5}$

$3x+9=y$ M.s.
$5x=y-1$
$5x=3x+9-1$
$2x=8$
$x=4;\ y=21$

20.) $\frac{x+y}{3}+x=15$

$\frac{x-y}{5}+y=6$

$4x+y=45 \mid \cdot \ldots I.$ M.s.
$x+4y=30 \mid \cdot \ldots II.$

$x=30-4y \ldots II.$
$4(30-4y)+y=45$
$120-16y+y=45$
$15y=75$
$y=5;\ x=10$

21.) $\frac{x-2}{5}+\frac{y-1}{8}=2$

$\frac{2x-5}{3}+2y=21$

$8x-16+5y-5=80 \mid \cdot 6$
$2x-5+6y=63 \mid \cdot(-5)$ M.s.k.

$48x+30y=606$
$-10x-30y=-340$

$38x=266$
$x=7;\ y=9$

22.) $\frac{x-2}{5}-\frac{10-x}{3}=\frac{y-10}{4}$

$\frac{2y+4}{3}-\frac{2x+y}{8}=\frac{x+13}{4}$

$12x-24-200+20x=15y-150$
$16y+32-6x-3y=6x+78$

$32x-15y=74 \mid \cdot 3$
$-12x+13y=46 \mid \cdot 8$ M.j. k.

$y=10;\ x=7$

23.) $2y-\frac{x-3}{5}=\frac{5y-2}{2}$

$2x-\frac{y-5}{5}=\frac{7x-7}{2}$

$20y-2x+6=25y-10$
$20x-2y+10=35x-35$

$2x+5y=16 \mid \cdot(-2)$
$15x+2y=45 \mid \cdot 5$ M.j. k.

$-4x-10y=-32$
$75x+10y=225$

$71x=193$
$x=\frac{193}{71}$
$y=\frac{150}{71}$

24.) $\frac{3x-5y}{2}+3=\frac{2x+y}{5} \mid \cdot 10$

$8-\frac{x-2y}{4}=\frac{x}{2}+\frac{y}{3} \mid \cdot 12$

$15x-25y+30=4x+2y$
$96-3x+6y=6x+4y$

$11x-27y=-30 \mid \cdot(-9)$
$9x-2y=96 \mid \cdot 11$ M.j. k.

$-99x+243y=270$
$99x-22y=1056$

$221y=1326$
$y=6;\ x=12$

25.) $\frac{3y-x-1}{2}+y-\frac{1}{4}=\frac{3(x-1)}{4} \mid \cdot 4$

$\frac{4y+3x}{5}=\frac{7x}{10}+2 \mid \cdot 10$

$6y-2x-2+4y-1=3x-3$
$8y+6x=7x+20$

$10y-5x=0 \ldots I.$
$8y-x=20 \ldots II.$

$x=2y \ldots I.$ M.s.
$8y-2y=20 \ldots II.$
$6y=20$
$y=\frac{10}{3};\ x=\frac{20}{3}$

26.) $3(x+1)-4(y+2)=3 \mid \cdot(-5)$
$7(x+1)-5(y+2)=20 \mid \cdot 4$

$-15(x+1)+20(y+2)=-15$
$28(x+1)-20(y+2)=80$

$13(x+1)=65$
$x+1=5$
$x=4;$

$3(4+1)-4(y+2)=3$
$4(y+2)=12$
$y+2=3$
$y=1$

27.) $\begin{array}{l} 7(x-2)+5(y+6)=21 \\ 4(x-2)-3(y+6)=12 \end{array} \Big| \begin{array}{l} 3 \\ 5 \end{array}$

$21(x-2)+15(y+6)=63$

$20(x-2)-15(y+6)=60$

$41(x-2)=123$

$x-2=3$

$x=5$

$7(5-2)+5(y+6)=21$

$5(y+6)=0$

$y+6=0$

$y=-6$

28.) $\frac{1}{x}+\frac{1}{y}=\frac{5}{6}$ Saberi

$\frac{1}{x}-\frac{1}{y}=\frac{1}{6}$

$\frac{2}{x}=\frac{6}{6}=1$

$x=2$

$\frac{1}{x}+\frac{1}{y}=\frac{5}{6}$

$\frac{1}{x}-\frac{1}{y}=\frac{1}{6} \Big| -1$

$\frac{2}{y}=\frac{4}{6}$

$y=3$

29.) $9\frac{1}{x}-4\frac{1}{y}=1 \Big| 5$ M.j. k.

$18\frac{1}{x}+20\frac{1}{y}=16$

$45\frac{1}{x}-20\frac{1}{y}=5$

$18\frac{1}{x}+20\frac{1}{y}=16$

$63\frac{1}{x}=21$

$\frac{1}{x}=\frac{1}{3}$

$x=3;\ y=2$

30.) $\frac{12}{x}+\frac{8}{y}=8 \Big| \begin{array}{l} 3 \text{ M.j.} \\ 2 \text{ k.} \end{array}$

$\frac{27}{x}-\frac{12}{y}=3$

$\frac{36}{x}+\frac{24}{y}=24$

$\frac{54}{x}-\frac{24}{y}=6$

$\frac{90}{x}=30$

$\frac{1}{x}=\frac{1}{3}$

$x=3;\ y=2$

31.) $\frac{5}{3x}+2y=9 \Big| -3$ M.j. k.

$\frac{8}{x}+3y=30 \Big| 2$

$-\frac{5}{x}-6y=-27$

$\frac{16}{x}+6y=60$

$\frac{11}{x}=33$

$\frac{1}{x}=3$

$x=\frac{1}{3};\ y=2$

32.) $\frac{8}{x}-\frac{9}{y}=1 \Big| 3$ M.j. k.

$\frac{34}{x}+\frac{27}{y}=26$

$\frac{24}{x}-\frac{27}{y}=3$

$\frac{34}{x}+\frac{27}{y}=26$

$\frac{58}{x}=29$

$x=2;\ y=3$

33.) $\frac{1}{3x}+\frac{1}{2y}=\frac{5}{6}$ saberi

$\frac{1}{3x}-\frac{1}{2y}=-\frac{1}{6}$

$\frac{2}{3x}=\frac{4}{6}$

$\frac{1}{x}=\frac{2}{2}=1$

$x=1;\ y=1$

34.) $\frac{2x}{5}-\frac{3}{y}=-\frac{13}{5} \Big| \begin{array}{l} 2 \text{ M.j.} \\ 3 \text{ k.} \end{array}$

$x+\frac{2}{y}=3$

$\frac{4x}{5}-\frac{6}{y}=-\frac{26}{5}$

$3x+\frac{6}{y}=9$

$\frac{4x}{5}+\frac{15x}{5}=-\frac{26}{5}+\frac{45}{5}$

$\frac{19x}{5}=\frac{19}{5}$

$x=1;\ y=1$

35.) $\frac{3}{x+1}+\frac{1}{y-2}=2 \Big| 2$ M.j. k.

$\frac{5}{x+1}-\frac{2}{y-2}=-\frac{1}{3}$

$\frac{6}{x+1}+\frac{2}{y-2}=4$

$\frac{5}{x+1}-\frac{2}{y-2}=-\frac{1}{3}$

$\frac{11}{x+1}=\frac{11}{3}$

$x+1=3$

$x=2;\ y=3$

36.) $3\left(\frac{3}{x}-\frac{2}{y}\right)-2\left(\frac{2}{x}-\frac{1}{y}\right)=15$

$2\left(\frac{1}{x}-\frac{1}{y}\right)-2\left(\frac{2}{x}+\frac{3}{y}\right)=2$

$\frac{9}{x}-\frac{6}{y}-\frac{4}{x}+\frac{2}{y}=15$

$\frac{1}{x}-\frac{1}{y}-\frac{2}{x}-\frac{3}{y}=1$

$\frac{5}{x}-\frac{4}{y}=15$

$-\frac{1}{x}-\frac{4}{y}=1 \Big| -1$

$\frac{5}{x}-\frac{4}{y}=15$

$\frac{1}{x}+\frac{4}{y}=-1$

$\frac{6}{x}=14$

$x=\frac{3}{7};\ y=-\frac{6}{5}$

37.) $x+y=16 \ldots$ I. saberi

$x+z=22 \ldots$ II. dvije

$y+z=28 \ldots$ III. jednadžbe.

$2x+2y+2z=66$

$x+y+z=33$

$x+y=16 \ldots$ I. $\Big| -1$

$z=17$

$x+y+z=33$

$x+z=22 \ldots$ II. $\Big| -1$

$y=11$

$x+y+z=33$

$y+z=28 \ldots$ III. $\Big| -1$

$x=5$

38.) $3x+5y=161 \dots I.$
$7x+2z=209 \dots II.$
$2y+z=89 \dots III.$

$3x+5y=161 \mid \cdot 7$
$7x+2z=209 \mid \cdot(-3)$
M.j. k.

$21x+35y=1127$
$-21x-6z=-627$
$35y-6z=500$
$2y+z=89 \mid \cdot 6$
$35y-6z=500$
$12y+6z=534$
$47y=1034$
$y=22$

$z=89-2y \dots III.$
$z=45$
$x=\frac{161-5y}{3} \dots I.$
$x=17$

39.) $x+2y=23 \dots I.$
$3x+4z=57 \dots II.$
$5y+6z=94 \dots III.$

$x+2y=23 \mid \cdot 3$
$3x+4z=57 \mid \cdot(-1)$
M.j. k.

$3x+6y=69$
$-3x-4z=-57$
$6y-4z=12$
$3y-2z=6$
$5y+6z=94 \dots III. \mid \cdot 3$
$9y-6z=18$
$5y+6z=94$
$14y=112$
$y=8$
$x=23-2y \dots I.$
$x=7$
$z=\frac{57-3x}{4} \dots II.$
$z=9$

40.) $x+y+z=14 \dots I.$
$x-y+z=6 \dots II.$
$x+y-z=10 \dots III.$

$x+y+z=14$
$x-y+z=6 \mid \cdot(-1)$
$2y=8;\ y=4$
$x-y+z=6$
$x+y-z=10$
$2x=16$
$x=8$
$z=2$

41.) $x+y-z=5 \dots I.$
$x+2y+z=13$
$2x-y+2z=6$

$x+y-z=5$
$x+2y+z=13$
$2x+3y=18 \mid \cdot 1$
$4x+y=16 \mid \cdot 3$

$+$ $x+y-z=5 \mid \cdot 2$
$2x-y+2z=6$
$2x+2y-2z=10$
$2x-y+2z=6$
$4x+y=16 \dots 4)$

$-2x-3y=-18$
$12x+3y=48$
$10x=30$
$x=3$
$y=16-4x \dots 4)$
$y=4$
$z=x+y-5 \dots I.$
$z=2$

42.) $x-3y+4z=8 \dots I.$
$x+2y+3z=14$
$3x-4y+5z=10$

$x-3y+4z=8 \mid \cdot(-1)$
$x+2y+3z=14$
$-x+3y-4z=-8$
$x+2y+3z=14$
$5y-z=6 \mid \cdot(-1) \dots 4)$
$5y+2z=16$
$3z=10$
$z=\frac{10}{3}$

$x+2y+3z=14 \mid \cdot 3$
$3x-4y+5z=10 \mid \cdot(-1)$
$3x+6y+9z=42$
$-3x+4y-5z=-10$
$10y+4z=32$
$5y+2z=16 \dots 4)$
$y=\frac{16-2z}{5}$
$y=\frac{28}{15}$
$x=8+3y-4z \dots I.$
$x=\frac{4}{15}$

43.) $3x+4y+5z=38$
$x+2y-z=4 \dots II.$
$6x+8y+3z=15$

$3x+4y+5z=38$
$x+2y-z=4 \mid \cdot 5$
$3x+4y+5z=38$
$5x+10y-5z=20$
$8x+14y=58 \mid \cdot(-1) \dots 4)$
$9x+14y=27$
$-8x-14y=-58$
$9x+14y=27$
$x=-31$

$x+2y-z=4 \mid \cdot 3$
$6x+8y+3z=15$
$3x+6y-3z=12$
$6x+8y+3z=15$
$9x+14y=27$
$y=\frac{58-8x}{14} \dots 4)$
$y=\frac{153}{7}$
$z=x+2y-4 \dots II.$
$z=\frac{61}{7}$

44.) $x+y-2z=6 \dots I.$ M.s
$3x-2z=13 \dots II.$
$3y=5z+4 \dots III.$

$y=\frac{5z+4}{3} \dots III.$
$x+\frac{5z+4}{3}-2z=6 \dots I.$
$3x+5z+4-6z=18$
$3x-z=14$

$3x-z=14 \mid \cdot 2$
$3x-2z=13 \mid \cdot(-1)$
$6x-2z=28 \dots 4)$
$-3x+2z=-13$
$3x=15;\ x=5$
$z=\frac{6x-28}{2} \dots 4);\ z=1$
$y=\frac{5z+4}{3} \dots III.;\ y=3$

45.) $\frac{x+y}{3}+2z=21 \dots I.$

$\frac{3x}{2}-\frac{z-y}{2}=38 \dots II.$

$3x-\frac{y+z}{2}=65 \dots III.$

$x+y+6z=63 \dots 2.)$

$3x-z+y=76$
$6x-y-z=13$ } +

$9x-2z=206$ | 5
$7x+5z=193$ | 2

$45x-70z=1030$
$14x+10z=386$

$59x=1416$

$x=24$

$x+y+6z=63$
$6x-y-z=130$ } +

$7x+5z=193 \dots 1.)$

$z=\frac{193-7x}{5} \dots 1.)$

$z=5$

$y=63-x-6z \dots 2.)$

$y=9$

46.) $3x+2y-4z=12 \dots I.$

$x:y=3:4 \dots II.$

$y:z=8:7 \dots III.$

M.S.

$y=\frac{4x}{3} \dots II.$

$z=\frac{7}{8}y \dots III.$

$z=\frac{7}{8}\cdot\frac{4}{3}x=\frac{7x}{6}$

$3x+2\cdot\frac{4x}{3}-4\cdot\frac{7x}{6}=12 \dots I.$

$18x+16x-28x=72$

$6x=72$

$x=12$

$y=\frac{4x}{3}=16$

$z=\frac{7x}{6}=14$

47.) $x+y+z=36 \dots I.$

$x:y:z=4:5:9 \dots II.$

$(x+y+z):x=(4+5+9):4 \dots II.$

36

$36:x=18:4 \; ; \; x=8$

$(x+y+z):y=(4+5+9):5$

$y=10$

$z=18$

48.) $\frac{2}{x}+\frac{3}{y}+\frac{1}{z}=23$ | -1

$\frac{2}{x}+\frac{3}{y}+\frac{4}{z}=46 \dots II.$

$\frac{5}{x}+\frac{10}{y}+\frac{4}{z}=75 \dots III.$

$-\frac{2}{x}-\frac{3}{y}-\frac{1}{z}=-23$

$\frac{2}{x}+\frac{3}{y}+\frac{4}{z}=46$

$\frac{3}{z}=23 \; ; \; z=\frac{23}{3}$

$\frac{2}{x}+\frac{3}{y}+\frac{4}{\frac{3}{23}}=46 \dots II.$

$\frac{5}{x}+\frac{10}{y}+\frac{4}{\frac{3}{23}}=75 \dots III.$

$\frac{2}{x}+\frac{3}{y}=\frac{46}{3}$ | 10

$\frac{5}{x}+\frac{10}{y}=\frac{133}{3}$ | -3

$\frac{5}{x}=\frac{61}{3} \; ; \; x=\frac{15}{61}$

$y=\frac{5}{12}$

49.) $\frac{3}{x}+\frac{4}{y}-\frac{6}{z}=3$

$\frac{1}{x}-\frac{3}{y}+\frac{2}{z}=\frac{1}{6}$ | 3

$\frac{2}{x}+\frac{3}{2y}+\frac{1}{4z}=2\frac{5}{6}$

$\frac{3}{x}+\frac{4}{y}-\frac{6}{z}=3$

$\frac{3}{x}-\frac{9}{y}+\frac{6}{z}=\frac{3}{6}$

$\frac{6}{x}-\frac{5}{y}=\frac{7}{2}$

$\frac{1}{x}+\frac{1}{y}=\frac{3}{2} \dots 1.) \; | \; 5$

$\frac{6}{x}-\frac{5}{y}=\frac{7}{2}$

$\frac{5}{x}+\frac{5}{y}=\frac{15}{2}$

$\frac{11}{x}=\frac{22}{2}$

$x=1$

$\frac{1}{x}-\frac{3}{4}+\frac{2}{z}=\frac{1}{6}$

$\frac{2}{x}+\frac{3}{2y}+\frac{1}{4z}=\frac{17}{6}$ | 8

$-\frac{1}{x}+\frac{3}{y}-\frac{2}{z}=-\frac{1}{6}$

$\frac{16}{x}+\frac{12}{y}+\frac{4}{z}=\frac{136}{6}$

$\frac{15}{x}+\frac{15}{y}=\frac{135}{6}$ | :15

$\frac{1}{x}+\frac{1}{y}=\frac{1}{6}=\frac{3}{2} \dots 1.)$

$\frac{1}{y}=\frac{3}{2}-\frac{1}{x} \dots 1.)$

$\frac{1}{y}=\frac{1}{2} \; ; \; y=2$

$z=3$

50.) $\frac{2}{x}+\frac{1}{y}=\frac{9}{4} \dots I.$

$\frac{3}{2z}-\frac{2}{3y}=\frac{5}{6}$

$\frac{1}{3x}-\frac{3}{2z}=\frac{1}{6}$ } +

$\frac{1}{3x}-\frac{2}{3y}=\frac{6}{6}=1$ | $\frac{2}{3}$

$\frac{2}{x}+\frac{1}{y}=\frac{9}{4}$

$\frac{1}{3x}-\frac{2}{3y}=1$

$\frac{4}{3x}+\frac{2}{3y}=\frac{3}{2}$

$\frac{5}{3x}=\frac{5}{2}$

$3x=2 \; ; \; x=\frac{2}{3}$

$\frac{2}{\frac{2}{3}}+\frac{1}{y}=\frac{9}{4}$

$y=-\frac{4}{3}$

$z=\frac{9}{2}$

51.) $x+y=3 \dots I.$ M.S.

$x+z=6 \dots II.$

$x+u=5 \dots III.$

$x+z+u=8 \dots IV.$

$(x+u)+z=8$

$x+u=5$

$5+z=8$

$z=3$

$x+z=6 \dots II.$

$x=3$

$x+y=3 \dots I.$

$x=3$

$y=0$

52.) $x+2y+3z+4u=30 \dots I.$
$3x+5y+7z+u=38 \dots II.$
$5x+8y+10z-2u=43 \dots III.$
$7x+6y+5z+4u=50 \dots IV.$

$x+2y+3z+4u=30 \quad / \dots I.$
$5x+8y+10z-2u=43 \quad / 2 \dots III.$

$11x+18y+23z=116 \dots 1.)$
$11x+18y+24z=119 \dots 2.)$

$3x+2y+z=10 \dots 3.)$

$11x+18y+23z=116 \quad / -1$
$11x+18y+24z=119$

$z=3$

$3x+2y+3=10 \dots 3.)$
$3x+2y=7$
$11x+18y=47 \dots 2.) \quad / 9 \quad / -1$

$16x=16 \,;\; x=1 \,;\; y=2 \,;\; u=4$

$3x+5y+7z+u=38 \quad / 2$
$5x+8y+10z-2u=43$

$11x+18y+24z=119 \dots 2.)$
$x+2y+3z+4u=30 \quad / 4 \dots I.$
$7x+6y+5z+4u=50$

$6x+4y+2z=20$
$3x+2y+z=10 \dots 3.)$

53.) $7x-13y=7 \dots I.$
$10z-3u=11 \dots II.$
$3x+4u=94 \dots III.$
$2u+3y=47 \dots IV.$

$3x+4u=94 \quad / \dots III.$
$2u+3y=47 \quad / -2 \dots IV.$

$3x-6y=0$
$x=2y$ Supstituiraj u jednadžbu I.

$14y-13y=7$
$y=7 \,;\; x=14$

$2u+21=47 \dots IV.$
$u=13$

$10z-39=11 \dots II.$
$z=5$

Zadaci prvoga stepena sa više nepoznanica.

1.) $x+y=82$
$x-y=8$
$2x=90$
$x=45$
$y=37$

2.) $x+y=78$
$x=12y$
$12y+y=78$
$y=6$
$x=72$

3.) A ima x,
B ima y
$x+y=70$
$x-y=24$
$2x=94$
$x=47$
$y=23$

4.) Stariji ima x g, mlađi y
$x-4=2(y-4)$
$x-16=14(y-16)$
$x-2y=-4$
$x-14y=-208 \quad / -1$
$12y=204$
$y=17$
$x=30$

5.) x gusaka, y patka
$x+y=83$
$\frac{x}{2}\cdot 5+y=125 \quad / -1$
$\frac{5x}{2}-x=42$
$x=28$
$y=55$

6.) Prva vrsta x K druga y K
$5x+11y=7\cdot 70 \quad / 3$
$3x+2y=2\cdot 32 \quad / -5$
$15x+33y=2310$
$-15x-10y=-1160$
$23y=1150$
$y=0{\cdot}5K$
$x=0{\cdot}4K$

7.) x gusaka sa 2x nogu
i y ovaca sa 4y nogu.
$x+y=83$
$2x+4y=272 \quad / -2$
$2y=106$
$y=53$
$x=30$

8.) U jednoj sobi x, u drugoj y
$x+y=18$
$x-3=y+3$
$x+y=18$
$x-y=6$
$x=12$
$y=6$

9.) x gospode, y gospoja.
$x+y=47$ M.S.
$x-3=y$
$x+x-3=47$
$x=25$
$y=22$

10.) Vrsti uputa za zad. 30. §.70.
Bilo je x dječaka i y djevojčica.
Najstariji dječak ima (x-1) brata a
y sestara; djevojčica ima (y-1) sestru i
x braće.

$y-1=x$
$2(x-1)=y$ M.S

$y=x+1$
$2x-2=x+1$
$x=3;\ y=4$

11.) Sin ima x g, otac y

$y-4=5(x-4)$
$y+17=2(x+17)$ M.S

$y=4+5x-20$
$y=5x-16$
$5x-16+17=2x+34$
$x=11;\ y=39$

12.) Ljudi ima x, žena y

$5x+4y=900+25$
$4x+5y=900-25$

$5x+4y=925 \mid -4$
$4x+5y=875 \mid 5$

$9y=675$
$y=75;\ x=125$

13.) $x+y=47$
$\frac{x-5}{y}=5$ M.S.

$x-5=5y$
$x=5y+5$
$5y+5+y=47$
$6y=42$
$y=7;\ x=40$

14.) $x=y+5$
$x=5y$

$5y=y+5$
$y=\frac{5}{4};\ x=\frac{25}{4}$

15.) $10x+y+27=10y+x$
$\frac{x\cdot 3}{2}=y$

$-9x+9y=27$
$y-x=3$
$\frac{3x}{2}-x=3$
$x=6$
$y=9$

Traženi je broj 69

16.) Po uputi u knjizi.

$2x=y$
$y-1=14-(x+y)$

$2x-1=14-(x+2x)$
$2x-1=14-3x$
$5x=15$
$x=3$ Traženi je
$y=6$ broj 365
$z=5$

17.) Općenito je oblik troznamenkasta broja $100x+10y+z$

$x+y+z=11$ .... I.
$100z+10y+x+29=2(100x+10y+z)$ .... II.
$100x+10z+y-36=100x+10y+z$ .... III.

$98z-10y-199x+29=0$ .... II.
$9z-9y=36$ ... III.
$z-y=4$
$z=4+y$
$x+y+4+y=11$ ... I.
$x+2y=7$

$98(4+y)-10y-199x+29=0$
$392+98y-10y-199x+29=0$
$88y-199x+421=0$
$2y+x=7 \mid 199$

$486y=972$
$y=2;\ x=3;\ z=6$

Traženi je broj 326

18.) A ima x, B y

$\frac{(x+y)\cdot 5\cdot 5}{100}=2772$
$\frac{5x}{100}=\frac{7y}{100}$

$x+y=50400$ M.S.
$5x=7y$

$x+\frac{5x}{7}=50400$
$12x=352800$
$x=29400$ K
$y=21000$ K

19.) Članova je bilo x, a trošak iznosi y

$6x+20=y$ Metoda
$7x-20=y$ komparacije

$6x+20=7x-20$
$x=40$
$y=260$ K

20.) A bi poršio posao za x dana, B za y dana
A s poršio za 1 dan $\frac{1}{x}$, B $\frac{1}{y}$ posla. Obojica zajedno poršie za 1 dan $\frac{1}{6\frac{2}{3}}=\frac{3}{20}$ posla

/: Nastavak na drugoj strani :/

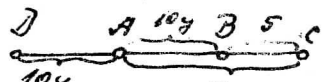
$\frac{1}{x}+\frac{1}{y}=\frac{3}{20}\ /\cdot 4$

$\frac{5}{x}+\frac{4}{y}=\frac{2}{3}$

$\frac{1}{x}=\frac{1}{15}$

$x=15;\ y=12$

22.)



Brzina je jednaka x, drugog y u 1 sek.

$10x-10y=5$

$10x+10y=55$

$20x=60$

$x=3m;\ y=2.5m$

23.) Temperatura $=x°C=y°R$

$1°C=\frac{80}{100}=\frac{8}{10}°R$

$x+y=18$

$\frac{8}{10}x=y$

$x+\frac{8}{10}x=18$

$x=10;\ y=8$

25.) A radi x dana

B y dana.

Zajedno za prvih 20 dana $x=3\cdot2$ "

(8 dana sam A, a 12 dana sam)

$\frac{1}{x}+\frac{1}{y}=\frac{1}{15}\ /\cdot 8$

$\frac{8}{x}+\frac{20}{y}=1$

$\frac{12}{y}=\frac{7}{15}$

$y=25\frac{5}{7}$

$x=36$

21.) Od jedne vrste x m od druge y m

$7x+6.5y=27250$

$6.5x+7y=27250-500=26750$

$70x+65y=272500$

$14x+13y=54500\ /\cdot 14$

$13x+14y=53500\ /\cdot -13$

$196x+182y=763000$

$-169x-182y=-695500$

$27x=67500$

$x=2500;\ y=1500$

24.) 1 kg čaja x

1 kg kave y

$8x+6y=34$

$8\left(x+\frac{10x}{100}\right)+6\left(y+\frac{20y}{100}\right)=38.24$

$4x+3y=17$

$800x+720y=3824\ /$

$4x+3y=17\ /\cdot -220$

$60y=84$

$y=1.4$ kuna

26.) A je radio x dana, a B $(x+7)$ dana.

A je dobio $4xK$, a B $(x+7).6K$

$4x+(x+7).6=242$

$4x+6x+42=242$

$x=20$ dana je radio A

B je radio 27 dana

27.) $x+y+z=11$

$100y+10x+z=100x+10y+z\ \ldots\ II.$

$100x+10z+y=100x+10y+z+18\ \ldots\ III.$

$40y=90x\ \ldots\ II.$

$y=x$

$9z-9y=18\ \ldots\ III.$

$z-y=2\ /\cdot -1$

$z+2y=11$

$3y=9$

$y=3;\ x=3;\ z=5$

$x+y+z=11$

$2y+z=11$

Traženi je broj 335

28.) Jedan kraj xK, drugi yK

a kola zK

$x+y+z=576$

$x+z=312\ \}+$

$y+z=360\ \}+$

$x+y+2z=672$

$x+y+z=576\ /\cdot -1$

$z=96K$

$x=216K$

$y=264K$

29.) x djece, y gospođa i z gospođa.

$x+y+z=70$

$x+y=3y\ \ldots\ II.$ M.S.

$x-y=z$

$y=\frac{x+y}{3}\ \ldots\ II.$

$x+\frac{x+y}{3}+x-y=70$

$6x+x+y=231$

$7x=224$

$x=32,\ y=13;\ z=25$

30.) x jabuka, y kruške

z breskva.

$x+y+z=1113$

$x=2y$ M.S.

$z=2x$

$x+\frac{x}{2}+2x=1113$

$\frac{7x}{2}=1113$

$x=318;\ y=159$

$z=636$

31.) $x+y+z=63$

$x=2y$ M.S.

$y:z=2:3$

$z=\frac{3y}{2}=\frac{3}{2}\cdot\frac{x}{2}=\frac{3x}{4}$

$y=\frac{x}{2}$

$x+\frac{x}{2}+\frac{3x}{4}=63$

$4x+2x+3x=252$

$9x=252$

$x=28;\ y=14;\ z=21$

32.) A treba x dana, B y dana C z dana.

$$\left.\begin{aligned}\tfrac{1}{x}+\tfrac{1}{y}&=\tfrac{1}{10}\\ \tfrac{1}{x}+\tfrac{1}{z}&=\tfrac{1}{12}\\ \tfrac{1}{y}+\tfrac{1}{z}&=\tfrac{1}{20}\end{aligned}\right\}+$$

$$\tfrac{2}{x}+\tfrac{2}{y}+\tfrac{2}{z}=\tfrac{14}{60}$$

$$\tfrac{1}{x}+\tfrac{1}{y}+\tfrac{1}{z}=\tfrac{7}{60}$$

$$\tfrac{1}{x}+\tfrac{1}{y}=\tfrac{1}{10}\ /-1$$

$$\tfrac{1}{z}=\tfrac{1}{60}$$

$$z=60$$

$$\tfrac{1}{x}+\tfrac{1}{y}+\tfrac{1}{z}=\tfrac{7}{60}$$

$$\tfrac{1}{x}+\tfrac{1}{z}=\tfrac{1}{12}\ /-1$$

$$\tfrac{1}{y}=\tfrac{2}{60}=\tfrac{1}{30}$$

$$y=30$$

$$\tfrac{1}{x}+\tfrac{1}{y}+\tfrac{1}{z}=\tfrac{1}{60}$$

$$\tfrac{1}{y}+\tfrac{1}{z}=\tfrac{1}{20}\ /-1$$

$$\tfrac{1}{x}=\tfrac{4}{60}=\tfrac{1}{15}$$

$$x=15$$

33.) $\left.\begin{aligned}x+y&=90\\ x-y&=17^\circ 24'\end{aligned}\right\}+$

$$2x=107^\circ 24';\ x=53^\circ 42';\ y=36^\circ 18'$$

34.) $\alpha+\beta+\gamma=180^\circ \dots I.$

$$(180-\alpha):(180-\beta):(180-\gamma)=10:17:18$$

$$[(180-\alpha)-(180-\beta)+(180-\gamma)]:(180-\beta)=(10-17+18):17$$

$$(180-\alpha-\gamma+\beta):(180-\beta)=11:17\dots 1.)$$

$$180-\alpha-\gamma=\beta \dots I.$$

$$2\beta:(180-\beta)=11:17\dots 1.)$$

$$34\beta=1980-11\beta$$

$$\beta=44^\circ$$

$$[(180-\alpha)+(180-\beta)-(180-\gamma)]:(180-\gamma)=(10+17-18):18$$

$$(180-\alpha-\beta+\gamma):(180-\gamma)=9:18=1:2\dots 2.)$$

$$180-\alpha-\beta=\gamma \dots I.$$

$$2\gamma:(180-\gamma)=1:2\dots 2.)$$

$$4\gamma=180-\gamma$$

$$5\gamma=180$$

$$\gamma=36^\circ$$

$$\alpha=100^\circ$$

35.) Katete su x i y

$$x+y=28$$

$$\frac{(x+2)(y-2)}{2}=\frac{xy}{2}+2$$

$$(x+2)(y-2)=xy+4$$

$$xy+2y-2x-4=xy+4$$

$$2y-2x=8$$

$$y-x=4$$

$$y+x=28$$

$$y=16;\ x=12$$

36.) Visine su x i y

$$x+y=20$$

$$\frac{ax}{2}:\frac{a}{2}y=2:3$$

$$x:y=2:3$$

$$y=\frac{3x}{2}$$

$$x+\frac{3x}{2}=20$$

$$5x=40$$

$$x=8;\ y=12$$

37.) Stranice su x i y

$$x-y=5$$

$$(x-3)(y+1)+12=xy$$

$$xy-3y+x-3+12=xy$$

$$3y-x=9$$

$$-y+x=5$$

$$y=7;\ x=12$$

38.) Veća je stranica x, manja y

$$(x+3)(y+7)=xy+228$$

$$(x+7)(y+3)=xy+184$$

$$xy+3y+7x+21=xy+228$$

$$xy+7y+3x+21=xy+184$$

$$3y+7x=207\ /7$$

$$7y+3x=163\ /-3$$

$$40x=960$$

$$x=24;\ y=13$$

39.) Dijagonale su x i y

$$x-y=5$$

$$\frac{(x+2)(y+2)}{2}=\frac{xy}{2}+30$$

$$xy+2y+2x+4=xy+60$$

$$2x+2y=56$$

$$x+y=28$$

$$x-y=5$$

$$x=\frac{33}{2};\ y=\frac{23}{2}$$

Izraelaja u knjizi pogrijesna.

40.) Naporedne su stranice x i y

$$x-y=6$$

$$\frac{(x+y)8}{2}=144$$

$$x+y=36$$

$$x-y=6$$

$$x=21;\ y=15$$

41.) Jedan ima x dionica drugi y.

$x - y = 5$

$\frac{(x-3)x}{2} - 40 = \frac{(y-3)y}{2}$

$y = x - 5$

$(x-3)x - 80 = (x-5-3)(x-5)$

$10x = 120$

$x = 12;\ y = 7$

42.) x kg prve vrste i y kg druge i treće.

$x + 2y = 144$

$\frac{48x + 36y + 24y}{144} = 40 \ldots$ II.

$\frac{12x + 9y + 6y}{144} = 10$

$4x + 5y = 480 \mid -1$

$x + 2y = 144 \mid 4$

$3y = 96$

$y = 32;\ x = 80$

U knjizi je pogrješno uzeta jednaka množina I. i II. vrste.

43.) U 6kg ~~kave~~ prebra čistine 0·750 ima 6·40 · 0·750 kg čista srebra. Prve vrste uzme x, druge $\frac{x}{2}$ treće y

$x \cdot 0{\cdot}670 + \frac{x}{2} \cdot 0{\cdot}720 + y \cdot 0{\cdot}900 = 6{\cdot}40 \cdot 0{\cdot}750$

$x + \frac{x}{2} + y = 6{\cdot}40$

$67x + 36x + 90y = 480$

$103x + 90y = 480 \mid -1$

$3x + 2y = 128 \mid 45$

$32x = 96$

x = 3kg prve vrste, 1·5kg druge vrste

y = 1·9kg treće vrste

44.) Po knjizi.

45.) Od bolje vrste uzeti će x l. Od lošije 3x l. Smjesi dolije još y l vode. Misli na to, da je voda bezvrijedna.

$x + 3x + y = 3825$

$\frac{40 \cdot 3x + 60 \cdot x}{3825} = 32$

$4x + y = 3825$

$\frac{180x}{3825} = 32$

$45x = 30600$

$x = 680\,l$

680 l bolje vrste
2040 l lošije vrste
i 3825 − 680 − 2040 =
= 1105 l vode.

46.) Baka će uzeti x kg, čista srebra 3x kg a srebra čistine 0·900 y kg. Vidi zad 43.

$3x \cdot 1 + y \cdot 0{\cdot}900 = 1{\cdot}38 \cdot 0{\cdot}835$

$3x + x + y = 1{\cdot}38$ M.S.

$4x + y = 1{\cdot}38$

$y = 1{\cdot}38 - 4x$

$3x + (1{\cdot}38 - 4x)\,0{\cdot}900 = 1{\cdot}38 \cdot 0{\cdot}835$

$3x - 3{\cdot}6x + 1{\cdot}242 = 1{\cdot}1523$

$0{\cdot}6x = 0{\cdot}0897$

$x = 0{\cdot}1495$ kg bakra, $3 \cdot 0{\cdot}1495 = 0{\cdot}4485$ kg čista srebra i 0·782 kg srebra čistine 0·900

47.) x l po 80k ; y l vode.

$162 + x + y = 258$

$162 \cdot 46 + x \cdot 80 = 258 \cdot 54$

$x + y = 96$

$80x = 258{\cdot}54 - 162{\cdot}46$

$80x = 13932 - 7452 = 6480$

$x = 81\,l$ vina po 80k
vode dolije 15..

48.) Vidi u knjizi.

49.) Od druge vrste uzme x, od treće $2x$, od četvrte $3 \cdot 2x = 6x$, a od prve vrte y kg.

$y + x + 2x + 6x = 260$

$1 \cdot 20 \cdot y + 140 \cdot x + 2 \cdot 20 \cdot 2x + 3 \cdot 6x = 260 \cdot 2 \cdot 40$

$12y + 14x + 44x + 180x = 260 \cdot 24$

$12y + 238x = 6240$

$6y + 119x = 3120$

$y + 9x = 260 \quad / \cdot (-6)$

$65x = 1560$

$x = 24$

$y = 44$

od I. vrste uzme 44 kg
" II. " " 24 "
od III. " " 48 "
" IV. " " 144 "

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§ 72. Čiste kvadratične i čiste kubične jednadžbe.

1.) $x^2 - 49 = 0$

$x^2 = 49$

$x = \pm 7$

2.) $3x^2 = 192$

$x^2 = 64$

$x = \pm 8$

3.) $\frac{x}{6} = \frac{6}{x}$

$x^2 = 36$

$x = \pm 6$

4.) $\frac{x^2}{x} = 2x$

$2x^2 = 72$

$x^2 = 36$

$x = \pm 6$

5.) $2 : x = x : 32$

$x^2 = 64$

$x = \pm 8$

6.) $x(x+1) = x+4$

$x^2 + x = x + 4$

$x^2 = 4$

$x = \pm 2$

7.) $\frac{1}{x-3} - 1 = \frac{x-4}{x^2-9} \quad / (x^2-9)$

$x + 3 - x^2 + 9 = x - 4$

$x^2 = 16$

$x = \pm 4$

8.) $3x(x+1) = 3x + 2478843$

$3x^2 + 3x = 3x + 2478843$

$x^2 = 826281$

$x = \pm 909$

9.) $11 - \frac{x+55}{x^2} = 3 - \frac{x-25}{x^2}$

$11 - 3 = \frac{x+55}{x^2} - \frac{x-25}{x^2}$

$8x^2 = 80$

$x^2 = 10$

$x = \pm\sqrt{10}$

10.) $\frac{(12+x)(x-3)}{12-x} = x + 3$

$(12+x)(x-3) = (12-x)(x+3)$

$12x + x^2 - 36 - 3x = 12x - x^2 + 36 - 3x$

$2x^2 = 72$

$x^2 = 36; \quad x = \pm 6$

11.) $(2x-3)(2x+3) = 7$

$4x^2 - 9 = 7$

$4x^2 = 16$

$x^2 = 4; \quad x = \pm 2$

13.) $4x^3 = 1372$

$x^3 = 343$

$x = 7$

12.) $\frac{x}{x+2} + \frac{x}{x-2} = \frac{8}{3}$ U knjizi liskarska pogrijeska

$\frac{x(x-2) + x(x+2)}{x^2 - 4} = \frac{8}{3}$

$\frac{2x^2}{x^2-4} = \frac{8}{3}$

$6x^2 = 8x^2 - 32$

$x^2 = 16; \quad x = \pm 4$

14.) $\frac{x^2}{25} = \frac{2160}{x}$

$x^3 = 729000$

$x = 90$

15.) $(x^2 - 6x)(x+6) = 6 \cdot 859 - 36x$

$x^3 - 6x^2 + 6x^2 - 36x = 6859 - 36x$

$x^3 = 6859; \quad x = 19$

16.) $3x \cdot 6x = 540$

$18x^2 = 540$

$x^2 = 30$

$x = \pm\sqrt{30}$

17.) $\frac{x}{5} : \frac{x}{7} = 4235$

$\frac{x^2}{35} = 4235$

$x^2 = 148225$

$x = \pm 385$

18.) $x:y = 11:13$

$xy = 7007$

$y = \frac{13x}{11}$

$x \cdot \frac{13x}{11} = 7007$

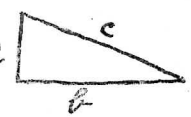
$\frac{13x^2}{11} = 7007$

$\frac{x^2}{11} = 539$

$x^2 = 5929$

$x = \pm 77;\ y = \pm 91.$

19.)



$c = 34$

$a = 30$

$b = ?$

$b^2 = c^2 - a^2$

$b = \pm\sqrt{c^2 - a^2}$

$b = \pm\sqrt{34^2 - 30^2}$

$b = \pm\sqrt{(34+30)(34-30)}$

$b = \pm\sqrt{64 \cdot 4} = 8 \cdot 2$

$b = \pm 16$

20.)

$(6x)^2 + (8x)^2 = 80^2$

$100x^2 = 6400$

$x = \pm 8$ sec.

21.)

$x:y = 8:15$ M.S

$x^2 + y^2 = 34^2$

$y = \frac{15x}{8}$

$x^2 + \left(\frac{15x}{8}\right)^2 = 34^2$

$x^2 + \frac{225x^2}{64} = 1156$

$289x^2 = 73984$

$17x = 272$

$x = 16;\ y = 30$

22.)

$x:y = 5:12$ M.S

$x^2 + y^2 = 26^2$

$y = \frac{12x}{5}$

$x^2 + \frac{144x^2}{25} = 676$

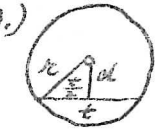
$\frac{169x^2}{25} = 676$

$\frac{13}{5}x = 26$

$x = 10$

$y = 24$

23.)



$r^2 = a^2 + \left(\frac{r}{2}\right)^2$

$r^2 = 10^2 + \left(\frac{21}{2}\right)^2$

$r^2 = 100 + \frac{441}{4}$

$r^2 = \frac{841}{4}$

$r = \frac{29}{2} = 14.5$

24.)

$p = \frac{x \cdot v}{2}$

$y^2 = v^2 + \left(\frac{x}{2}\right)^2$

$168 = \frac{24x}{2}$ ... I.

$y^2 = 24^2 + \frac{x^2}{4}$

$12x = 168$ ... I.

$x = 14$ M.S

$y^2 = 24^2 + \frac{x^2}{4}$

$y^2 = 24^2 + \frac{14^2}{4}$

$y^2 = 625$

$y = 25$

25.) $\frac{a}{2}\sqrt{3} = 24$

$a = \frac{48}{\sqrt{3}}$

$p = \frac{a}{2} \cdot \frac{a}{2}\sqrt{3} = \frac{\frac{48}{\sqrt{3}}}{2} \cdot 24 =$

$= \frac{48}{\sqrt{3}} \cdot 12 = 48 \cdot \sqrt{3} \cdot 4$

$p = 192\sqrt{3}$

26.) $r^2\pi = 100$

$r = \sqrt{\frac{100}{\pi}} = \sqrt{\frac{100\pi}{\pi^2}}$

$r = \frac{10}{\pi}\sqrt{\pi}$

27.)

Stranica kvadrata = je $\frac{1}{4}$ opsega, dakle $a = 6$

$r = \frac{1}{2}a$

$a = a\sqrt{2}$

$r = \frac{1}{2}a\sqrt{2}$

$r = \frac{1}{2} \cdot 6\sqrt{2} = 3\sqrt{2}$

Sadržaj.

Prvih je 17 paragrafa izostavljeno poradi jednostavne izrade.

Djelji vostbrojeva.

Općenito o djeljivosti ..... 1.
Rastavljanje na faktore ..... 3.
Najveća zajednička mjera ..... 4.
Najmanji zajednički mnogokratnik .... 7.

Računanje s razlomcima.

Svojstva razlomaka ..... 10.
Preobražavanje razlomaka ..... 10.
Zbrajanje 12
Odbijanje ..... 15.
Množenje cijelim brojem ..... 18.
Dijeljenje cijelim brojem ..... 19.
Množenje razlomkom ..... 20.
Dijeljenje razlomkom ..... 24.
Međusobni odnošaj prostih razlomaka i decimalnih brojeva ..... 26.

Zaključni račun.

1. Prosti zaključni račun ..... 28.
2. Složeni zaključni račun .....

Omjeri i razmjeri.

Omjeri ..... 37.
Razmjeri ..... 40.
Prosto pravilo trojno ..... 43.

Procentni račun ..... 48.
Prosti kamatni račun ..... 56.
Diskontni račun ..... 63.

Dioberno pravilo.

A Dijeljenje po aritmetičkom omjeru ..... 66.
B. Dijeljenje po geometričkom omjeru ..... 68.
1.) Prosto dioberno pravilo ..... 68.
2.) Sastavljeno dioberno pravilo .... 74.
Popriječni račun ..... 79.
Račun smjese ..... 79.

Skraćeno računanje s decimalnim brojevima.

Nepotpuni brojevi ..... 81.
Skraćeno zbrajanje ..... 81.
Skraćeno odbijanje ..... 81.
Skraćeno množenje ..... 83.
Skraćeno dijeljenje ..... 88.
Primjena ..... 91.

Opća aritmetika.

Opći brojevi ..... 92.
Zbrajanje općih brojeva ..... 95.
Odbijanje općih brojeva ..... 97.
Zbrajanje algebarskih brojeva ..... 99.
Odbijanje algebarskih brojeva ..... 100.
Množenje monoma 103
Množenje binoma ..... 104.
Množenje polinoma ..... 108.

Dijeljenje monoma ..... 110.
Dijeljenje polinoma ..... 111.
§ 59. Računanje s
razlomcima ..... 120.
Opća svojstva razlomaka ..... 125.
Zbrajanje i odbijanje razlomaka 126.
Množenje razlomaka 129
Dijeljenje razlomaka ..... 132.
Kvadriranje i drugi
korijen dekadskih brojeva.
Kvadriranje ..... 137.
Drugi korijen ..... 140.
Kubiranje i treći korijen.
Kubiranje ..... 144.
Treći korijen ..... 150.
Jednadžbe.
Rješavanje linearnih jednadžbi ... 157.
Algebarski zadaci ..... 174.
Jednadžbe prvoga stepena s a više
nepoznanica ..... 187.
Liste kvadratične i kubične jednadž-
be ..... 208.

Umoljava se, da se eventualne
pogrješke i nedostaci jave
pismeno nakladnoj knjižari.

Ilmiš 20/IV. 1918.

(Gimnazijalac.)